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American Society of Hospital Pharmacists

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IN THIS ISSUE

Preparing Papers for Presentation or Publication 515
Hamilton H. Anderson

Visual Aids to Better Patient Care 518
Herbert R. Riemen

New Program of Operation for Evaluation of Drugs 522

What Constitutes a Limited Control Program in Hospital Pharmacy? 525
Noel E. Foss

A Procedure for Detecting the Dilution of Meperidine Hydrochloride in Multiple Dose Vials 529
James D. McKinley, Jr.

Formulation of Liquid Nutrients for Oral and Nasogastric Feeding 531
Anthony F. Aiello and Orville H. Miller

An Evaluation of Certain Bacteriostatic Agents Used in Multiple Dose Vials Sterilized by Autoclaving 534
Wesley R. Gladhart, Jr., Ronald M. Wood and W. Arthur Purdum

International Pharmaceutical Federation Meets in London 540

Atlanta Institute 545

ASHP Affiliates 555
ASHP Officers and Committees 486
As the Vice-President Sees It 556
Current Literature 551
Book Reviews 552
Editorial 513
Letters 511
New Members 564
News Items 557
Positions 566
Therapeutic Trends 547
Timely Drugs 549

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LETTERS

Further Comment on Published Article

DEAR SIRS: In the September-October (1954) issue of THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS there was a letter to the Editor from a clinician critically evaluating an article published in the September-October (1953) issue of that journal. ("An Evaluation of Paper Used for Wrapping Articles to be Sterilized," by Beck, Shay and Purdum). I should like to request that this reply to the critical evaluation be published in the section of THE BULLETIN designated for this purpose.

The critic indicated that "dry heat resistant spores must be used for this work." In the experimentation dry heat resistant spores of the *Bacillus subtilis* group were used. Not all members of this group produce heat resistant spores satisfactory for this purpose, and one cannot be sure until he works with the specific members of this group whether he has a spore former of suitable resistance. Further, some members of this group produce 95 to 100 percent spores after three to five days' incubation; whereas, other members will not produce this number of spores if they are incubated 30 days. The length of time of incubation is not so important as the selection of a suitable variety of organism. In this experiment proof of the presence of the numbers of spores was confirmed microscopically. Their resistance to heat was established in the same manner as described by Vera, H.D., *Applied Microbiology* (Vol. 1, p. 117, 1953). The use of one gram of garden soil in a paper bag as a test inoculum, as described by Ecker and suggested by the critic, is not valid since when using soil one has no idea what species of organisms of any significance are present in the soil sample. An organism should be used for which the cultural characteristics are known and the resistance has been established. The method suggested by Vera *Applied Microbiology* Vol. 1, p. 117, 1953) for testing sterility is certainly the more valid technique. To inoculate a test package with a known amount of spore suspension of either *Clostridium* or *Bacillus* is certainly a more controlled procedure than that performed with one gram of soil.

The strength tests performed on the paper samples before and after autoclaving were conducted to determine the ability of the paper to stand up under handling, autoclaving pressure and temperature. The favorable results obtained indicated the papers of choice. Further, sterility tests indicated that the recommended papers permitted the passage of steam in spite of the surface tension barrier of the water film in the paper. This quality was confirmed by the sterility obtained and the length of time the material remained sterile during storage.

The original article indicated the possible savings of a typical large hospital; therefore the "economic virtues" of paper will not be discussed here.

In view of the excellent results obtained when using paper for wrapping articles to be sterilized under normal and "exaggerated" conditions, one cannot fail to recognize the original report as a valuable attempt to suggest an improved method. As in other avenues of research, continued efforts by trained investigators are needed to help improve our old techniques with the idea of helping to make this world a better and safer place in which to live.

DONALD E. SHAY, PH.D., *Head*
Department of Bacteriology
Baltimore College of Dental Surgery
Dental School, University of Maryland
Baltimore, Maryland

Graduate Program at Massachusetts College

DEAR SIRS: Our attention has just been called to the description of our special graduate curriculum in hospital pharmacy on page 239 of THE BULLETIN for May-June (Vol. 12, No. 3). In order that an accurate description may be available in your files, we furnish the following information regarding the special curriculum in hospital pharmacy at the Massachusetts College of Pharmacy:

This curriculum leads to the degree of Master of Science in Pharmacy and requires the completion of thirty credit hours of graduate work, including an internship in hospital pharmacy. A formal report covering the results of one piece of investigative work in hospital pharmacy must be presented to the Graduate Council. This curriculum requires twenty-two months for completion.

The internship is divided between the Peter Bent Brigham Hospital (William E. Hassan, Jr., Pharmacist-in-Chief) and the Massachusetts General Hospital (John T. Murphy, Pharmacist-in-Chief). During the summer months it requires full time (40 hours per week) and during the regular session of the College it requires part time (12 hours per week).

The course work is taken during two regular sessions of the College. It includes graduate courses in physical chemistry, pharmacology, and management, in addition to the course in hospital pharmacy.

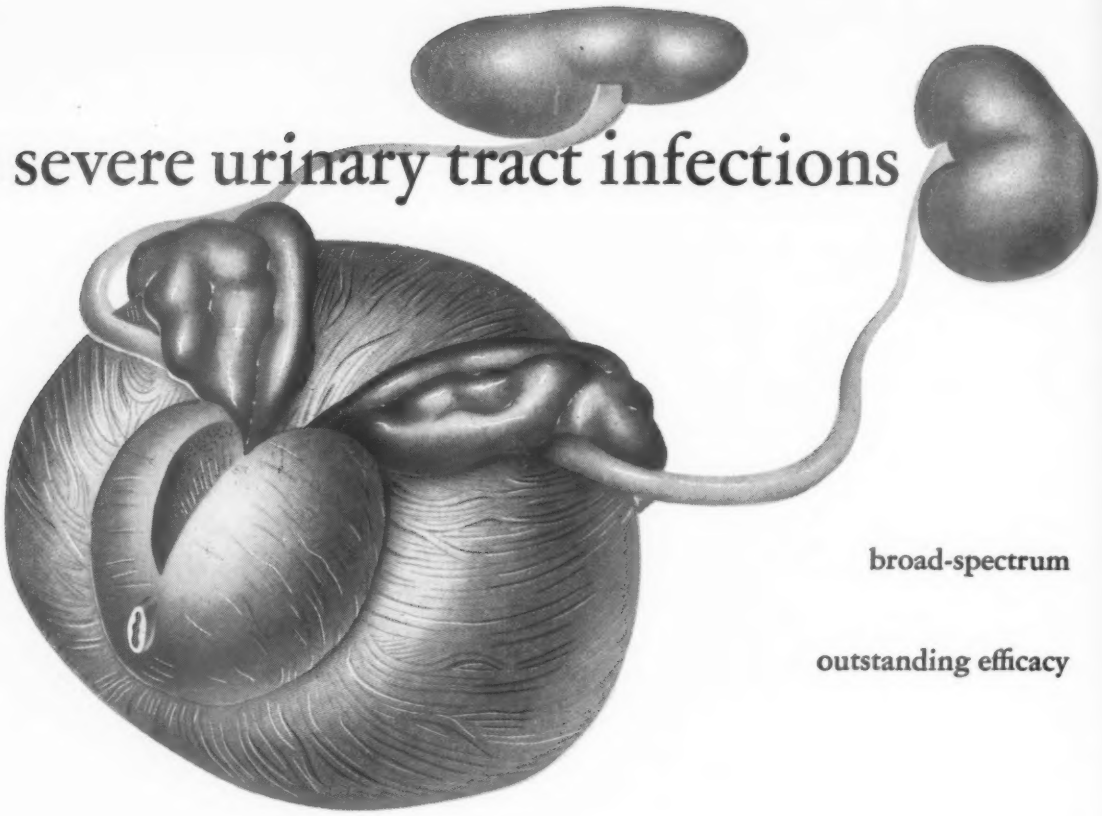
H. C. NEWTON, *Dean*
Massachusetts College of Pharmacy
Boston, Massachusetts

Appreciation for The Bulletin

DEAR SIRS: I would like to take this opportunity to congratulate the staff of THE BULLETIN on the fine job they are doing in collecting and presenting to the hospital pharmacists the valuable information included in your publication.

G. R. LETOURNEAU, *Pharmacist*
Mary Fletcher Hospital
Essex Jct., Vt.

in severe urinary tract infections



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EDITORIAL

Drug Evaluation Program

by Don E. Francke

New principles and procedures have been adopted by the Council on Pharmacy and Chemistry of the American Medical Association for its program of drug evaluation. Under the new program (see page 522), seals of acceptance for drugs will no longer be issued nor will individual brand names for drugs be accepted by the A.M.A. Council.

The two changes are closely related. During recent years the marketing of numerous brands of an identical drug by pharmaceutical producers has tended to confuse physicians and pharmacists alike. Often, the first step in marketing a duplicate product was for the producer to apply to the A.M.A. Council for acceptance of its brand name and to obtain a "seal of acceptance" for its product. The latter was then used in advertising and promotional literature to physicians and pharmacists.

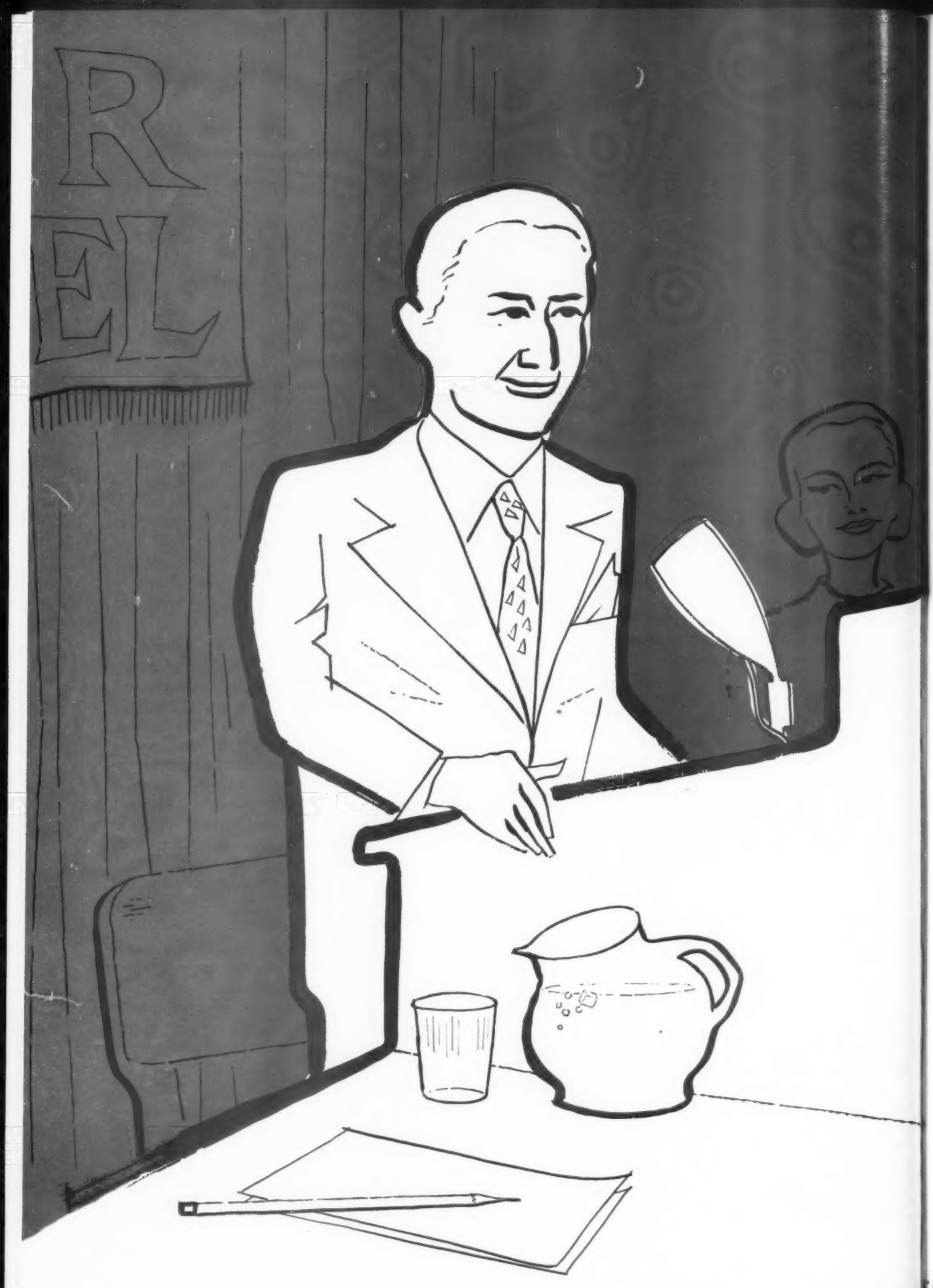
There is little question but that the seal of acceptance program of the A.M.A. has had an appreciable effect in fostering the successful marketing of additional brand names and thus has increased product duplication with its attendant problems. Furthermore, the processing of many different brands of identical drugs became so cumbersome and time-consuming that much of the true potential of the evaluation program was lost. Too much time had to be devoted to an evaluation of brands of drugs already well established in therapy. This time could have been spent more profitably in evaluating new drugs and in studies contrasting the special merits or deficiencies of individual members of a closely related group of drugs. Thus these two factors — product duplication and the time required to process acceptance of brands of drugs — created a situation which made it increasingly difficult for the Council on Pharmacy and Chemistry to achieve its prime function of encouraging rational therapeutics.

The chief merit of the seal of acceptance program was its use with newly developed drugs. Here it served to notify all concerned that the new drug had been evaluated by a recognized group and had been found to be pharmacologically and therapeutically sound. However, this same notification can still be accomplished without the use of the seal of acceptance. A statement in the advertising or promotional literature to the effect that the drug has been accepted by the Council on Pharmacy and Chemistry is all that is needed. However, the firm must exercise caution not to misrepresent the basis upon which the drug was accepted by the Council.

An innovation in the new evaluation program is the use of generic names exclusively in the monographs prepared by the Council on Pharmacy and Chemistry for publication in *New and Nonofficial Remedies*. It has long been the Council's position that "the use of generic names in the place of trade names for prescribing tends to diminish confusion and the difficulties in learning a multiplicity of names for the same drug." This new practice of using generic names exclusively in N.N.R. monographs will greatly popularize their use. This will be particularly true in hospitals, where teaching plays an important role and where the relationship between the pharmacist and the medical staff is usually very close.

Dosage forms are no longer given in the monographs prepared for N.N.R. This is related to the policy of not accepting individual brands of drugs. Pharmacists must be prepared to furnish this information concerning dosage forms to physicians. This opportunity for increased professional service and responsibility will be welcomed by hospital pharmacists.

The new drug evaluation program of the American Medical Association has many interesting features which show promise of more effectively promoting rational therapeutics. Hospital pharmacists are in a particularly strong position to assist in this basic objective.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EL

PREPARING PAPERS
for presentation or publication

by HAMILTON H. ANDERSON

THE EARLY GREEKS, according to Bett (1953) idolized Apollo, god of beauty, culture, rhetoric, and poetry. He had a favorite son, Æsculapius, upon whom he bestowed the divine gift of healing. Physicians have described themselves, at times, as children of Apollo, although I am not certain you would agree that such description would apply today. During the Renaissance, however, medicine was said to be a part of the learning of every scholar, and more important, literature was a part of the learning of every physician.

The doctor, like the apothecary, in an earlier day led a more leisurely existence. Neither possessed too much technical knowledge, or even a typewriter! Not even a dictaphone, or a research or manuscript secretary, or a ghost writer, or a great host of predecessors to compose the material with which to build a manuscript. However, from a literary standpoint I am certain we would agree that our predecessors produced classical articles which are far more beautiful than those we produce today with all our "handmaidens."

The rapid growth and multiplication of specialties within pharmacy and allied fields such as medicine have made the simple task of yesterday an astronomical chore of today. The earlier symbiotic relationship between the applied sciences and classical literature no longer exists. Our own areas have become so vast that we now are faced with a multidimensional problem. Few of us know intimately even one specialized field of scientific endeavor. Pity, then, the marginal man, or the outlander who knows, presumably, far less than we do of our own peculiar scientific jargon. If we cannot completely understand our varied resource materials and scientific reporters, how can we hope to convey our thoughts to a presumably eager, but less well informed audience?

Certainly it is true in medicine, and I believe that it is true in the allied sciences, that the writings of specialists of one field are not comprehended readily by those outside it. Does it not behoove all of us, then, to state simply and in generally acceptable terms the ideas we are trying to portray for others? Is it not something like an expanded prescription which we *should* write in legible English and with clearly stated contents and directions for use by a gullible public?

We do not have, today, intimate acquaintance with the "anatomy of language;" the laboratory influence with its objective approach has stripped us of the clothes used by the classical writers of the past. We use symbolic formulas for conveying to those able to understand, the bare essentials of our scientific recordings. If we are willing to admit our shortcomings, and perhaps aquiesce to this sad state in which we find ourselves, then we come to grips with our problem. It is: what are the bare essentials that make for acceptable form and content in today's literature?

First Essential: To have something to say that has not been said before. It might be well to take six months before initiating research, to study the literature adequately with all the indexes and journals and monographs and facts at our disposal. This means a review of at most 3,000 journals in the medical and allied sciences. You know these reference service materials: *Chemical Abstracts, Current List of Medical Literature,* the *Surgeon General's Index Catalogue,* the *Quarterly Cumulative Index Medicus,* to mention only the most frequently consulted sources.

Second Essential: To develop a skeleton outline of what we propose to present. This should include:

1. A reasonably brief but informative intro-

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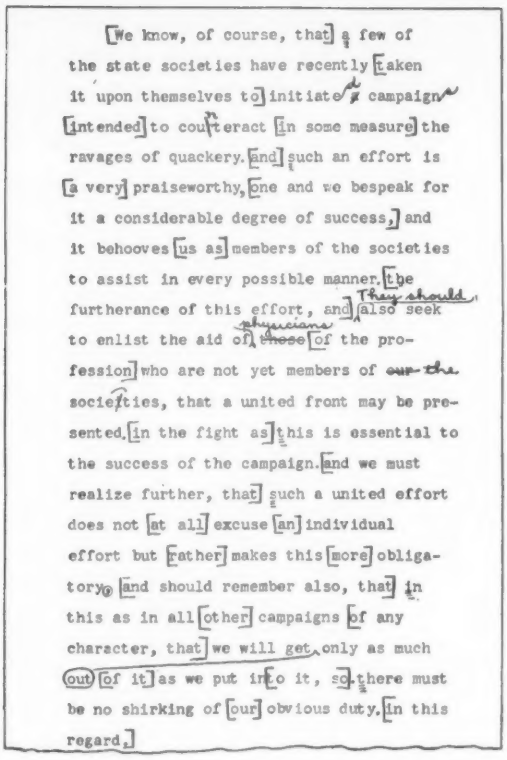
[We know, of course, that] a few of
the state societies have recently [taken
it upon themselves to] initiate a campaign
[intended] to counteract [in some measure] the
ravages of quackery. [And] such an effort is
[a very] praiseworthy, one and we bespeak for
it a considerable degree of success, and
it behooves [us as] members of the societies
to assist in every possible manner. [the
furtherance of this effort, and] They should also seek
to enlist the aid of physicians [these of the pro-
fession] who are not yet members of ~~our~~ the
societies, that a united front may be pre-
sented. [in the fight as] this is essential to
the success of the campaign. [and we must
realize further, that] such a united effort
does not [at all] excuse [an] individual
effort but [rather] makes this [more] obliga-
tory. [and should remember also, that] in
this as in all [other] campaigns [of any
character, that] we will get only as much
out [of it] as we put into it, so [there must
be no shirking of [our] obvious duty. [in this
regard,]

duction, with a statement of the problem as we visualize it.

2. A statement of methods employed, not duplicating readily available reports of others unless significant modifications have been made in the procedures employed.

3. A report of results, given in most simple and understandable terms, but with sufficient clarity for others to confirm the findings.

4. A discussion of results, adhering to the problem at hand, and indicating what possible significance they might have as a contribution to our knowledge.

5. A summary, stressing only the real advances that the research has made.

Third Essential: To make as dramatic and clear-cut presentation of the report as human scientific decency will permit. This does not mean an attempt to impress the hearer or reader with the profundity of the author's knowledge, the gaudiness of his description, or the facility with which he manipulates sesquipedalian terminology. Rather, it means the transmission of all relevant facts and their attendant connotations in the most stimulating and meaningful way. Further, the information should be presented to those who will properly appreciate it. Oftentimes, very significant researches are presented too poorly, to groups or in publications not truly representative of the specific field of endeavor. Many papers very quickly are lost sight of and are unceremoniously buried. (Sometimes, if not significant, this is a deserved fate). However, if significant work should be repeated by others who spell-bind their audiences with a glamour which exceeds the scientific excellence of the work, these people will get credit for another's earlier and more significant contribution.

Bett may be paraphrased, in part, to stress the complex content of this third essential.

First and foremost there is *Brevity*. Your paper should be short, composed of short paragraphs, which in turn are composed of short sentences. Whenever possible, use simple, short words. There seems to be a prejudice that, if an article is not long enough, it will not attract attention. Any editor will tell you this is not so.

Title. A good title means a lot to the success of your paper. It should be short, yet sufficiently descriptive. Above all, it should be attractive. Beware of making it too paradoxical, obscure, or even misleading, lest it perplex an unfortunate cataloguer or librarian. It should not contain more than four key words.

Arrangement. Every paper naturally has a beginning, a middle, and an end. A short introduction should give the reason for your article and should briefly refer to previous publications on the subject.

Try to make your paper, even though it be highly technical, as interesting as you can. We all know that the language of pharmacy and medicine can be very difficult, but there is no reason why it should be at the same time dull. Writers today are not only afraid of romance—they even fight shy of humor.

A striking opening note to your paper will be welcomed by most readers.

Avoid long paragraphs with continuous lines. Break up your text at suitable intervals with the aid of subheadings and indentations. Finish with a summary. This may be the only part of your paper which many people will ever read. It should be comprehensible without having to wade through the paper itself.

Conventions. To avoid delay in publication, see that your paper strictly follows the conventions adopted by the journal for which you intend to write. These conventions include the references to other people's work at the end of the article. If a paper to which you refer has been written by three or more authors, it is in order to put *et al. (et alii)* after the first name. Always state the inclusive pagination for any article you quote, to give the reader an idea of its scope. In the case of a difficult foreign language it is helpful to mention in the reference whether there is a summary in English or French, for example.

Style. The essence of style has been described as the avoidance of (1) wind, (2) obscurity. The problem of pharmaceutical and medical jargon is a vexed one. There is *technical* jargon, which is the heritage of any rapidly growing science, and there is *composition* jargon, which is simply an offence against literary style.

Scientists seldom begin—they commence; they do not make—they render; they do not meet—they en-

counter; doctors do not see patients—only cases. Nothing ever happens before—only prior to. And so on, *ad infinitum!*

Illustrations. This is an important subject which really requires a talk in itself. A good illustration which really does illustrate your text may save you much verbiage. Data in tables and other illustrations should not be duplicated in the text.

Statistics. This again is a subject which requires a lecture in itself. If you are contemplating a carefully controlled pharmaceutical experiment which you intend to report, you should obtain the help of a scientific statistician. Don't be afraid of statistics—they are not all higher mathematics. Experimental design and evaluation, with the help of a statistician, is invaluable.

Summary. Never send an editor a carbon copy of your paper, lest he wonder who has received the original—a rival editor, perhaps?

Carefully keep a carbon copy for yourself.

Do not publish the same article in another journal in a slightly different form.

Verify your references. Take no reference for granted. Accuracy is imperative.

Make your paper as short as you can. Then make it still shorter.

Finally, I should like to enumerate a few pitfalls for the unwary, and also to unburden myself of a few pet peeves.

The language of the chemist, while admittedly more precise than that of the biologist, is still not universally acceptable—even to the chemists. We have, as you know, the American, the British, and the so-called International systems of nomenclature.

Latin, with the exception of generic terms, should be avoided. Few of us today are classical scholars who know enough Latin to indulge in abbreviating a language unknown to us.

Fishbein has spoken of the tyranny of abbreviations. I must say I agree. We find no real agreement among scientific journals on abbreviations of some of the most simple, commonly used scientific words.

While we may think our own report is final, conclusions are seldom if ever justified. A summary is far more justifiable, and generally acceptable. After all, no initial report is accepted finally. Until the work has been repeated by another independent group, scientists will not grant full validity to the original results reported by a single group of investigators.

Each of us has a set of rules that we live by as reporters of our own findings. There are rules for me, as a member of a University faculty and Chairman of the Board of Editors for the University of California Publications in Pharmacology. If you are writing a chapter for a textbook or a monograph in pharmacy or pharmacology, the "Preparation of Manuscripts," is available from publishers.

Publisher to Author, suggestions on manuscript and proof together with a note on the University of California Press, was published in 1953. If you wish copies of this brochure (of 48 pages) address your inquiry to the Secretary, Editorial Committee, and Manager, Publishing Department, University Press, Berkeley.

Other source materials of help to authors are included in the list of references. Of greatest value, I believe, you will find the "Hints to Authors" of the American Chemical Society. Also helpful is Hough's "Scientific Terminology," which includes classical terms, and pharmaceutical and other scientific nomenclature. A standard for reference in medical publications is Fishbein's "Medical Writing." This also gives a list of periodicals listed in the "Quarterly Cumulative Index Medicus", as well as other periodicals not thus indexed. These are culled from many similar source materials.

If you are writing for an international audience, then the Chronicle of the World Health Organization should be consulted for current lists of nonproprietary names. I am certain you are acquainted with the *International Pharmacopœia* which was published in 1951. I believe both the British and American pharmacopœias will conform, as best they can, so that eventually we may have some uniformity in names of accepted drugs.

Summary

Let us consider a scientific report as simply the composite parts of an expanded prescription, i. e. as we would like to see one written properly.

The patient—might be the introduction;
The superscription—the methods employed;
The inscription—the findings obtained;
The subscription—a discussion of these findings;
The signature—the summary;
The registry number—the references.

The preparation of papers for presentation or publication is somewhat more complicated, but it can be well done and effectively done, in a language that all of us should understand. Be specific, direct, and brief, and the contribution you make will be truly appreciated.

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VISUAL AIDS

to better patient care

by HERBERT R. RIEMEN

DAILY THE FUNCTIONS OF A HOSPITAL PHARMACY are becoming more numerous and complex. In most cases the day of merely compounding and dispensing is a thing of the past. Our responsibilities now include bulk manufacturing, preparation of sterile solutions, and the manufacture and preservation of sterile ophthalmic solutions. In any instance the hospital pharmacist is responsible for the formal or informal education of hospital personnel directly concerned with the care of patients. This obligation is fulfilled by active participation in nursing and intern education programs. In larger, so-called teaching hospitals, this involves many hours of planning and presentation each week. In the smaller hospitals, in which no formal educational program is carried on by the pharmacy staff, it may include a readily accessible, up-to-date reference file of drug information. In either instance the visual aid is a valuable tool.

Principle

"The greatest sources of learning in order of effectiveness are:

1. Experiencing a thing directly.
2. Seeing a picture, film or model.
3. Being told about it by one who has direct experience.
4. Reading about it."

Point two of this principle is the one which concerns us most at the moment. Elaborating on this aspect we see that "Visual education is a method of imparting information which is based upon the psychological principle that one has a better conception of the object he sees than of the object he reads about or hears discussed." We can integrate this principle into our everyday practices and in so doing keep the nurses and physicians abreast of the times regarding trends and technics in current drug therapy. The visual aids to be discussed also serve in many cases to save valuable time and money, both of which present a problem in the care of the modern hospital patient. Four specific aids which have proven of value are:

1. Specialized Labels.
2. A Display Window.
3. Current Drug Bulletins.
4. The Formulary.

Labels

We are all familiar with the standard small type labels in common use—*POISON, SHAKE WELL, STORE IN A COOL PLACE.* Specialized small type labels can be used quite effectively to remind the intern or nurse administering a drug of the current theory which forms the basis of its intelligent administration. For example, the nonpyrogenicity of a sterile, intravenous fluid is questionable once the vacuum in the flask has been broken and the solution allowed to stand for over twelve hours. Occasionally the pharmacist must destroy the vacuum in the flask in preparing a sterile intravenous fluid extemporaneously. To remind the nurse of the short "shelf life" of this solution, a label, as shown in Figure 1, is affixed

FIGURE 1

PATIENT'S NAME_____ ROOM NO._____

IF NOT ADMINISTERED BEFORE_____

RETURN TO PHARMACY

to the bottle by the pharmacist. The printed portion being in red emphasizes the importance of not using the solution after the specified time. In the blank space after "If Not Administered Before," the present time plus twelve hours is entered

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followed by the date. The label on the flask (see Figure 2) indicates that tetracycline was added to the liter of 5 percent dextrose in water at 10:30 A.M. on February 8, 1955 for the label has been made out to read "If not administered before 10:30 P.M. 2/8/55 RETURN TO PHARMACY." In this way the patient's welfare is safeguarded and the nursing staff knows exactly the limitations of the solution.

FIGURE 2. *Shown is a flask, the vacuum of which was broken when the pharmacist added the tetracycline. The solution is no longer useful after the time indicated on the special label attached to the flask.*

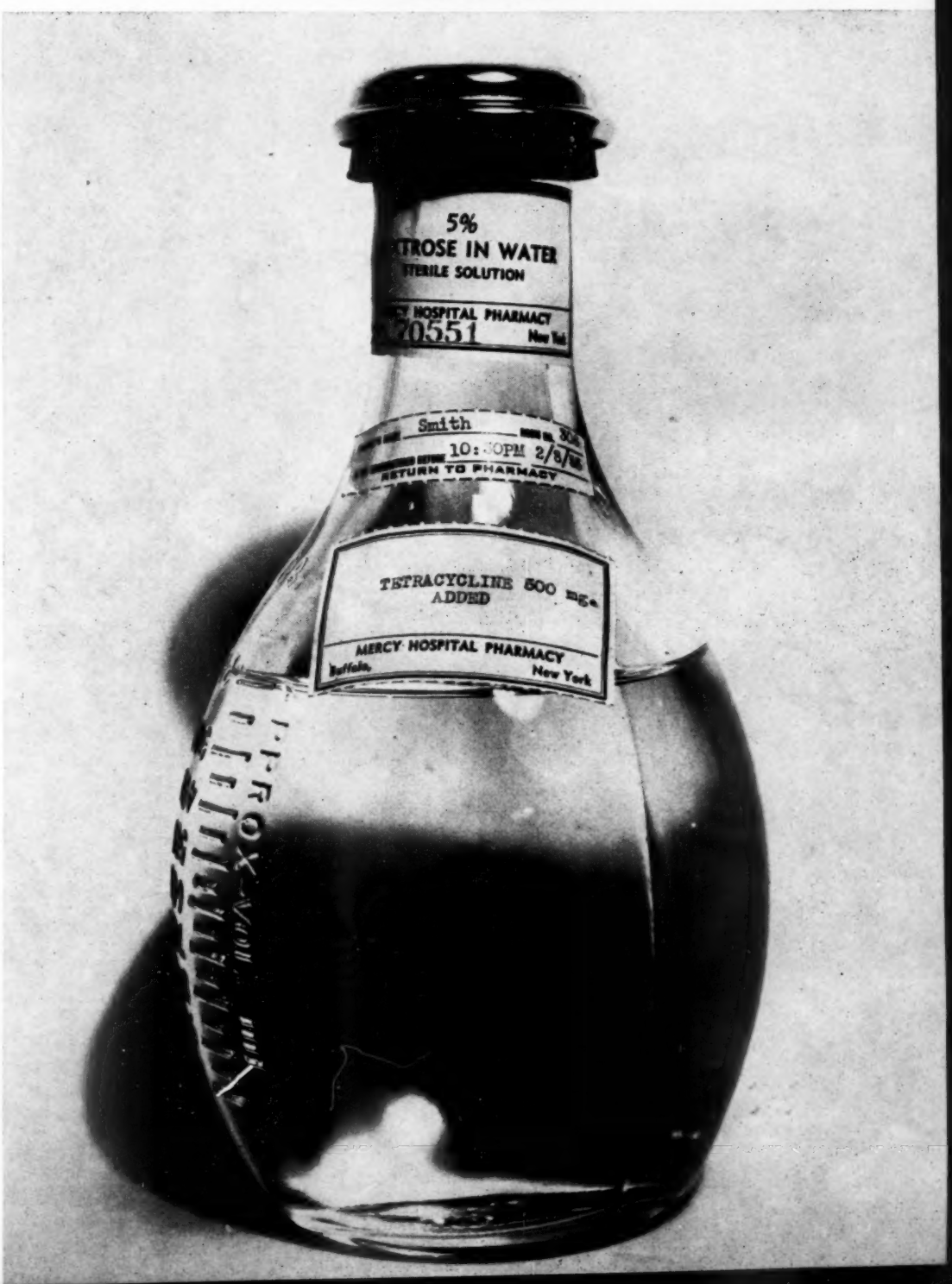

FIGURE 4. *A recent display depicted a classification of antihypertensives. During the display mimeographed copies of the Table listing proprietary antihypertensive drugs and their mode of action (reprinted from The Bulletin, July-August, 1954) were left in the pamphlet rack below window.*

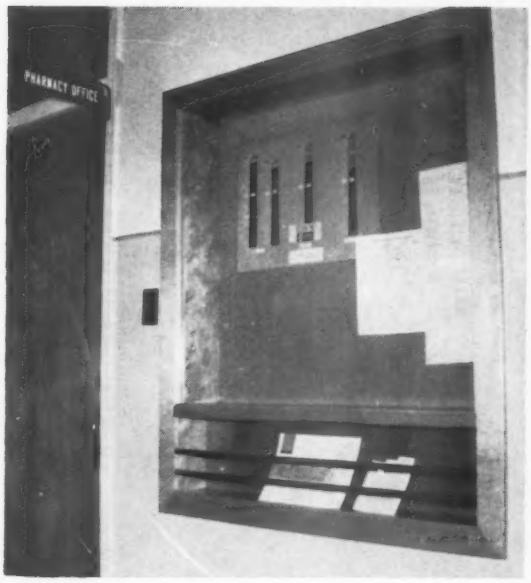

FIGURE 5. *Electrolyte solutions available from the Pharmacy were made known by means of a colored Gamblegram. A list of these solutions together with their milliequivalent concentrations was compiled. Mimeographed copies of the lists used on the Bulletin Board were left in the pamphlet rack.*

FIGURE 6. *A page in the Current Drug Manual of Mercy Hospital supplied by the Department of Pharmacy to each Nurses' Station.*

MERCY HOSPITAL
PHARMACY _____ CURRENT DRUG BULLETIN

NAME DORIDEN

CHEMISTRY a-ethyl-a-phenyl-glutarimide

DESCRIPTION

DORIDEN is a wholly new type of oral non-barbiturate hypnotic-sedative. Non-narcotic, it is also chemically different from chloral hydrate, paraldehyde and bromides. When Doriden is given as recommended, its action is characterized by

rapid onset---15 to 20 minutes
excellent depth of hypnosis
4 to 8 hours of physiologic sleep.

INDICATIONS

Insomnia --In hypnotic dosage, Doriden is usually sleep-producing in 15 to 20 minutes.

Dosage: 0.25 to 0.5 Gm 1/2 hour before bedtime.

Pre-surgery Sedation
Dosage: 0.5 Gm the night before surgery; 0.5 to 1.0 Gm one hour before anesthesia.

Daytime Sedation in Anxiety-Tension States (hypertension, menapause, coronary thrombosis, anxiety neuroses, hysteria, epilepsy, thyroid disease.)
Dosage: 0.25 Gm t. i. d. or q. i. d. after meals.

E F G H I J K L M N O P Q R S T U V W Y Z

A second label which has found much practical use is shown in Figure 3. Quite frequently a patient is discharged before he has received all the medication for which he was charged. If the container

FIGURE 3

Patient's Name_____ Room No._____
has been charged for this drug. Credit will be given
for unused portion returned to the pharmacy.

RETURN TO PHARMACY

in which the medication was packaged is not clearly marked as to whom the medication belongs, the patient more than likely will not receive proper credit for the unused portion. Instead these drugs will be kept for future use and the first patient will absorb the expense until the supply is exhausted. With the individual's name and room number typed clearly in the blanks the nurses can easily determine the patient to whose account the drug charge has been made and promptly return it for credit prior to the time of discharge. The small amount of time consumed by this added service in the pharmacy is readily compensated for by financial saving to the patient and by prevention of the accumulation of unused drugs.

Display Window

An attractive well-kept display window is an asset in any phase of pharmacy. We generally associate it more with the retail field because of the prominent place the window space occupies and the drawing power it presents. This general principle can be applied to hospital pharmacy with equal effectiveness. The display window in the hospital pharmacy serves one purpose—to inform. With drugs changing so rapidly there is a wealth of subjects that can be built into attractive displays. These may include the classification of antihypertensive drugs, the spectrum of the antibiotics, electrolyte and fluid balance, and the rapidity of onset and duration of action of the insulins. There are many more, since each hospital and its pharmacy have their own peculiar problems.

One thing must be kept in mind in regard to displays of this sort. They must be changed frequently. If a display is allowed to remain for too long a period it will no longer stimulate interest. A static display window program will benefit neither the staff nor the pharmacy in any hospital. A month is usually the maximum length of time that any display will remain effective. More frequent changes are advisable. However, if time does not allow this a monthly display should prove adequate. Shown in Figures 4 and 5 are two displays which were used to advantage in our hospital.

New Product Bulletins

The new product bulletin is becoming essential in most hospitals. Modern drug therapy is making more rapid strides with each passing decade. These changes are adding to the responsibilities of the hospital pharmacist in that he must not only become familiar with the new items himself but must also help the nurses and physicians in his institution to be familiar with them. This can be easily accomplished by sending new product bulletins to each nursing station when the use of a new product indicates it.

These bulletins need not be elaborate but rather a brief review of the drug, giving both the generic and proprietary name, description, pharmacology, dosage, and side reactions. If there is any toxicology worthy of note, this too should be included. It is advisable to have these bulletins printed on loose leaf sheets and to furnish loose leaf binders with alphabetized separators to each nursing station. In this way the information can be kept permanently on file at the nursing station thus being available for use at all times.

Formulary

The primary value of a formulary is not that of a visual aid. It is rather a standard of drug therapy as determined by the Pharmacy and Therapeutics Committee. However in hospitals using a formulary, it has become a source of learning; it places at the disposal of the nursing personnel a ready reference containing the classification, forms available, dosage and in some cases the toxicology of the therapeutic agents used most frequently by the staff physicians. Figure 6 illustrates a page of the Formulary of Mercy Hospital.

Summary

The visual aid has been used more and more extensively as a teaching tool during the past several years. Whether the pharmacy takes part in an educational program or not the principles involved can quite frequently be used to help solve problems and keep the personnel informed. Here knowledge gained in other professions, in this instance that of teaching, can be integrated with benefit to us in our associations with the other professional personnel and to the patient whose care is the primary objective of all of us.

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NEW PROGRAM OF OPERATION FOR

EVALUATION OF DRUGS

By authority of the Board of Trustees of the American Medical Association, the Council has terminated the seal-acceptance program in favor of a new program designed to render a better service to the medical profession. The following statement adopted by the Council is issued to explain the purpose, guiding principles, and operation of the new program.

R. T. STORMONT, M.D., *Secretary*

THE RATE AT WHICH NEW DRUGS ARE BEING DEVELOPED and marketed is increasing constantly. Often these new agents are extremely valuable additions to our therapeutic armamentarium; however, many of them are also capable of doing more harm than good if prescribed or administered in an indiscriminate fashion without full appreciation of their possible harmful effects or observance of necessary precautionary measures. A calculated risk is involved in the use of drugs that have pharmacological effects of any real significance. Therapeutic agents that have a relatively narrow margin of safety or a high index of serious side-effects should not necessarily be condemned and discarded completely. The proper use of such drugs often will save life or provide beneficial effects not obtainable with any other means of therapy. The physician has the serious responsibility of weighing the possible harmful effects of a drug against the apparent need for it in the individual patient. Obviously, an appreciation of the valid indications for use as well as the known properties of any new drug is necessary in order to serve the best interests of the patient.

Many pharmaceutical firms recognize their responsibility to the medical profession and endeavor to provide such information in brochures and other literature as is necessary for relatively safe and proper usage of their new drugs. Promotional literature, however, that contains unwarranted indications for use and minimizes or neglects the mention of contraindications, possible serious side-effects, and necessary precautionary measures, does not encourage the practice of rational therapeutics.

There is an increasing demand from the medical profession in general for concise and timely reports that contain an authoritative, unbiased evaluation of new therapeutic agents. The former acceptance program of the Council served a useful purpose in this regard for many years; however, in this present era of rapid new developments in therapeutics, the work involved in processing for acceptance many different brands of a drug became cumbersome and time-consuming to the extent that physicians could no longer be provided with the type of service they desired. Consequently, termination of the seal-acceptance program became necessary in order that the Council could embark on an expanded program of operation that would be of much more interest and value to the profession.

The New Program

Under the new program drugs will be evaluated at the earliest possible opportunity in order to

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serve the best interests of the profession. As a rule the greatest interest in a new drug occurs at about the time it is introduced on the market for general use. This is also the time when there is the most need for an unbiased report containing information that will aid physicians in the judicious or proper use of such medication. Evidence relating to a new use or significant change in the status of a drug will also be evaluated and reported on as the occasion demands.

Pharmaceutical firms are encouraged to cooperate with the Council by forwarding complete data or reports (published and unpublished) of all laboratory and clinical investigations relating to the safety and usefulness of new drugs in order that evaluation reports may be made to the profession at the earliest possible date. Cooperation with the Council in the selection of suitable nonproprietary names for new drugs before such agents are ready to be placed on the market is also encouraged.

The former official rules of the Council have been superseded entirely by the following description of the new program of operation.

General Purpose

The function of the Council on Pharmacy and Chemistry is to examine and evaluate available evidence relating to the actions, uses, dosage, hazards, and other pertinent properties of drugs and to encourage rational therapy by timely, informative reports to the medical profession.

Special committees appointed by the Council also deal with particular matters such as research projects and the toxicologic aspects of pesticides and household chemicals.

Principles Governing the Evaluation of Drugs for Inclusion in New and Nonofficial Remedies

The Council evaluates evidence pertaining to the safety and usefulness of medicinal agents offered or intended for use in or on the human body for the diagnosis, prevention, or treatment of disease. Reports of these evaluations are published for the information of the medical profession.

The Council considers for evaluation drugs with a single active ingredient or extracts from a single source. Combinations or mixtures containing two or more active ingredients may receive consideration only if it is deemed desirable to present the Council's views regarding any such preparation for the information of the medical profession.

In evaluating drugs the Council considers scientific clinical and laboratory evidence (published or unpublished) submitted by manufacturers and such other reports as may be available. The Council also endeavors to obtain the opinions and advice of other experts who serve in a consultant capacity. The Council does not undertake to conduct clinical and laboratory tests or experiments in evaluating drugs.

The Council may from time to time reevaluate a drug or evaluate evidence relating to a new use or route of administration for a drug.

The views of the Council with respect to the actions, uses, dosage, contraindications, hazards, limitations, and other pertinent characteristics of each evaluated drug are submitted in the form of a monograph to the Editor of *The Journal* of the American Medical Association for publication in the Council column. These monographs are subsequently included in the Council's annual publication, New and Nonofficial Remedies.

If the Council's reevaluation of a drug reveals a significant change in its status, such information is submitted to the Editor of *The Journal* for publication and subsequently incorporated in New and Nonofficial Remedies.

The Council encourages the early adoption and use of a nonproprietary name for general use in prescribing, naming, and identifying each drug. The Council believes that such names tend to diminish confusion and are in the interest of the patient and physician. Each drug evaluated is described by a nonproprietary name.

When the Council has knowledge that a drug is no longer available commercially or when it has been included in the United States Pharmacopeia, National Formulary, or New and Nonofficial Remedies for 20 years, the monograph may be deleted from New and Nonofficial Remedies.

The Council does not accept, endorse, recommend, or guarantee any individual brand or preparation of a drug described in New and Nonofficial Remedies. The Council does not undertake to test or analyze samples or to review or investigate manufacturing and control procedures. The Council does not purport to ascertain whether or not any firm has complied with federal, state, or municipal laws and regulations.

Specific Procedure

1. All pharmacological and clinical evidence or data in the form of published and unpublished reports on a new drug that are made available to the Council office will be referred to a number of recognized experts who will be asked to serve in a consultant capacity.

2. The views of the consultants regarding the adequacy of the evidence for the claimed uses of the new drug, as well as comments regarding such information as the limitations, contraindications, hazards, and dosage will then be transmitted to a

member of the Council who will serve as a referee.

3. The referee will consider all the available evidence, as well as the views and comments of the consultants, and will make an evaluation recommendation.

4. A member of the Council staff will prepare a proposed report or monograph on the new drug based upon the referee's evaluation and recommendation.

5. The proposed monograph, the referee's recommendation, the views and comments of the various consultants, and reprints or photostats of all the available evidence will be transmitted to all the members of the Council for consideration.

6. The proposed monograph will be revised in accordance with the comments and criticisms of the members until it is satisfactory to the Council as a whole and adopted for publication in *The Journal*.

7. A copy of the proposed monograph will then be sent to the pharmaceutical firm or firms that supplied the evidence and data on which the Council's evaluation was based in order that they will have an opportunity for comment or criticism.

8. If there is no criticism of the proposed monograph, it will be sent to the Editor of *The Journal* for publication in the Council column. Any criticisms offered by the firm will receive due consideration before the proposed monograph is sent to the Editor for publication. When the monograph is published, credit will be given the firm or firms supplying the evidence or data on which the Council's evaluation of the drug is based.

9. Provision will be made for frequent publication of supplementary Council statements or reports on each new drug as evidence accumulates to justify recognition of additional valid claims for use, dosage changes, hazards, and contraindications. The same procedure for evaluation will be followed in these instances as with the initial consideration of a new drug.

10. Necessary changes or revisions based upon these supplementary statements or reports will be made in New and Nonofficial Remedies at the end of each year.

New council programs

After months of study by the councils concerned and the Board of Trustees, a revision of the programs of the scientific councils of the Association was announced in *The Journal* in February (*J.A.M.A. 157*:664 [Feb. 19] 1955). For many years these councils have provided leadership in the evaluation of products used by physicians and, to a lesser extent, by the public. In the evaluation programs, council seals were awarded to manufacturers and distributors of drugs, foods, devices, and cosmetics that met acceptance requirements. In some instances the prominence given to the seal of acceptance program made it appear to dominate the work of the councils in the collecting, analyzing, and disseminating of medical information. Additionally, the evaluation of a multitude of individual brands, rather than classes of products, became so time-consuming that it threatened to interfere with the broader aspect of the council programs.

For these reasons new and more effective programs are being adopted by the scientific councils —programs that do not require the inspection of individual products or the issuance of seals. The seals of the councils and the advertising emblems of *The Journal* and *Today's Health* will no longer appear in Association publications. Firms and individuals to whom the seals have been issued in the past have been notified of the new program and requested to eliminate the seals from collateral advertising and promotional material by August 15, 1955.

There is published elsewhere in this issue of *The Journal* (see page 1170) an announcement of the new program of the Council on Pharmacy and Chemistry. Similar announcements by the Council on Foods and Nutrition, the Council on Rehabilitation, and the Committee on Cosmetics will follow shortly. It is our belief that the new programs will be of greater value to the profession and the public. Released from the detail of individual brand evaluation, the scientific councils are now free to carry out their broad objectives by methods more suited to the current needs of the profession.

Also published elsewhere in *The Journal* (see page 1175) are the Principles of Advertising for the Publications of the American Medical Association. These principles are essentially the same, in spirit, as those by which products have been accepted for advertising in A.M.A. periodicals for many years. Thus all readers can be assured that discontinuance of the so-called seal program will not mean a lowering of advertising standards. The special knowledge of the councils, and of other expert bodies if indicated, will be used for guidance, and no product will be accepted for advertising unless the rules are met.

The above editorial appeared in the *J. Am. Med. Assoc. 158*:1172 (July 30) 1955.

What constitutes A LIMITED CONTROL PROGRAM in hospital pharmacy

by NOEL E. FOSS

ALTHOUGH MOST HOSPITAL PHARMACISTS are familiar with the term *control program,* perhaps it would be well to define the term before discussing this important subject.

Control, according to Webster, means the exercise of restraint or regulation. *Control* is also defined as checking, verifying, or testing by parallel tests or experiments. For the purpose of discussion in this paper, let us further qualify or circumscribe the use of control to manufactured products.

Although most of you are familiar with the term *manufactured products,* there seems to be a considerable difference of opinion concerning the precise definition of the term. One might say that a pharmacist manufactures a product each time he compounds and dispenses a prescription, although, generally speaking, a prescription prepared in a hospital pharmacy or retail pharmacy is not considered to be a manufactured product. Likewise, one might say that the extemporaneous preparation of a quart of Dobell's solution or Aromatic Elixir might be considered to be the preparation of a manufactured product. For the purpose of my discussion today, however, I will limit *manufactured pharmaceutical products* to bulk quantities of pharmaceutical products and preparations requiring the utilization of mechanized equipment. The things I am going to mention can apply equally well to the preparation of pharmaceutical products on a smaller scale.

Working Formula

The first step in the manufacture of a pharmaceutical product is the assembling of a working or manufacturing formula. This formula should include the kind, quality, and quantities of the respective ingredients together with precise directions for their compounding and processing. Often it will be necessary to carry out some preliminary development work to determine if the finished product contains the required amount of active ingredients and is stable for a reasonable period of time. This development work is particularly necessary for preparations which are not described in the U.S.P. or N.F.

The inclusion of the quality or purity of chemicals or drugs described in the formula is of prime importance. Generally speaking, U.S.P or N.F. drugs are adequate for most preparations. Many persons are under the impression that C.P. (chemically pure) and Reagent Grade chemicals are superior to U.S.P. and N.F. chemicals or drugs for manufacturing use or the preparation of pharmaceutical products.

Tablet disintegration time is tested by a member of the Pharmacy Staff at the Massachusetts General Hospital.

NOEL E. FOSS is Dean of the School of Pharmacy, University of Maryland.

Let us for a minute consider Reagent Grade chemicals, which are usually thought of as being superior to U.S.P. or N.F. grade chemicals. The name implies that they are free of impurities and especially designed for the preparation of reagents. Actually, as all of you know, there is no chemical which is free of all impurities. Every chemical or drug regardless of the description assigned to it contains at least traces of impurities or foreign substances. In some instances of Reagent Grade chemicals, these traces may be less than the maximum limits allowed by the U.S.P. and N.F., and in other instances, the impurities may exceed the maximum limits permitted by the U.S.P. and N.F. monographs. When you specify a U.S.P. or N.F. chemical, you can consult the respective monograph to learn the maximum amount of impurities permitted. When you purchase a C.P. or Reagent Grade chemical, you will not know the maximum amount of the various impurities unless you consult the catalogues or specifications of each supplier. In other words, a Reagent Grade chemical offered by company X may or may not contain the same amount of impurity or foreign substance as the reagent grade chemical offered by company Y. This is something to consider when you specify a grade of chemical other than U.S.P. or N.F. Of course, all drugs and chemicals are not described in the U.S.P. or N.F. and it is, therefore, necessary for you to indicate other qualifications in those instances. A. C. S. reagent, U. S. P. reagent, N. F. reagent, and N. N. R. in some cases indicate widely accepted standards which can be specified when U.S.P or N.F. quality is not available or does not suffice.

Most manufacturing pharmaceutical companies sample and examine the chemicals and drugs which they procure to determine if they meet the specifications under which they were purchased. In most instances, such a procedure is not feasible or economically practical for hospital pharmacies. It, therefore, becomes necessary to rely upon the integrity of the company from which you purchase your chemicals and drugs. This obviously means that it is not always prudent to purchase from the company which gives the lowest quotation. It is hardly necessary for me to tell you that you will not receive first quality merchandise if you insist upon buying from the company which offers the lowest price.

Standards For Chemicals

Although it is often assumed that all chemicals and drugs which meet the standards of the U.S.P. and N.F. or some other specification are equivalent in quality, a more critical examination of chemicals reveals that this is not always the case. Let us take odor, for instance. The U.S.P. monograph states that diethylstilbestrol is an odorless powder. Some U.S.P. samples tend to have a slight phenolic odor. Of course, odors are difficult to evaluate and particularly quantitatively. Or let us take color, for instance. The U.S.P. states that ascorbic acid occurs as white or slightly yellow crystals or powder. What is slightly yellow? Or even white, for that matter? Many of you may not have recognized that there can be several different grades of white insofar as it applies to the color of drugs. Powders that differ only slightly in color may all appear to be white when used separately. When the same samples of dextrose are placed on white paper and then viewed together it becomes evident to even the untrained eye that there is a slight variation in the hue or degree of whiteness. You may ask what significance the slight difference in color may have if the powder meets the requirements of the U.S.P. From a therapeutic standpoint, the powders do not show any significant difference. Otherwise, the U.S.P. would make the requirements for color more rigid. To the hospital pharmacist, who is going to make a parenteral solution from these powders, these differences in color may assume some importance. Even though the dilution may be only 5 percent, these slight differences in color become more pronounced when the dextrose is dissolved in water. Further, the differences in color may be accentuated when the solution is sterilized. Some hospital pharmacists take pride in the preparation of a colorless parenteral solution of dextrose 5 percent. They, therefore, will not want to use any powder which is not a "white" white, which is the common way to describe such colors in the trade. Further, the hospital pharmacist may receive a complaint from the nurse or physician that the solution is not colorless, like the former batch previously supplied on earlier orders. It is simply astonishing how critical some physicians and nurses may be of medicinal substances supplied by the Pharmacy. I have mentioned only the color of parenteral solutions. Of course, the same holds true for the color of tablets, ointments, and all the other chemicals and drugs which are used medicinally. When the dosage form is purchased or handled by the patient, the complaints are often multiplied since lay persons are even less familiar with drugs and chemicals and it becomes more difficult to explain minor differences.

Density

Another physical property of chemicals or drugs which may cause difficulty is the apparent density of powders; that is, the volume occupied by a unit weight of the powdered material. If a powder is dispensed in unit packages, it is customary to select and use a container which will be well filled by the

unit weight which is to be dispensed. But the next batch or lot of the chemical or drug may be considerably more bulky or fluffy so that the bottle or container will be filled by only seven-eighths of the weight that was formerly packaged. Or still another batch may be so dense and heavy that one pound fills only half the container. Unfortunately, the manufacturing chemist or manufacturing pharmacist is not always able to control the apparent density of the chemicals he makes. As a result, the hospital pharmacist should examine the chemicals or drugs which he purchases to determine that the apparent density is reasonably uniform. The N.F. and U.S.P. have recently recognized this problem and have appointed committees to work on methods for determining the apparent density of powders. It is quite possible that a method or methods for determining the apparent density of powdered chemicals and drugs may appear in one of the compendia.

Dirt

Before leaving the problems involved in the inspection of drugs and chemicals, I would like to mention dirt. In the case of processed drugs or chemicals as opposed to those that are mined or obtained from the soil as plant products, there is always present soot and carbon since the drugs or chemicals are usually manufactured or processed in industrial areas. In spite of the commendable efforts made to rid cities of industrial smoke and dirt, most manufacturing chemical plants employ coal as some source of energy and, in addition, are near water-ways or railroads that use coal, oil, or gas as a source of fuel. As a result every plant which produces chemicals has to contend with the ever-present soot or carbon which is prevalent the year round. I do not mean a large amount of soot so that the appearance of the white or yellow chemical may approach a gray. I am referring to only occasional particles of carbon or soot. If the chemical or drug is to be made into a solution before it is used in a pharmaceutical preparation, there is no problem in separating the dirt and soot because the solution can be filtered. If a white powder containing only occasional particles of soot is to be made into a tablet, there are immediate difficulties, since the soot cannot be separated from the powder. Further, when the powder is sifted during the tablet making process, the small particles of soot or dirt may be broken into smaller particles and thus we have more instead of less particles of dirt.

Control Numbers

For proper manufacturing pharmaceutical control, a copy of the working formula should be prepared each time that a batch of a preparation or product is manufactured, and a number should be assigned to each formula or batch. Further, the control number of each of the ingredients used in this batch should be recorded on the formula. The batch number of the formula should be carried forward on all containers which are employed for the preparation or storage of the product. This batch number will identify the particular lot and will permit referral to the specific lots of chemical that were used in this preparation. It is surprising how frequently you may wish to determine the lot of a chemical which was used in the manufacture of a product, particularly if it does not prove to be as elegant or as stable as previous batches of the product manufactured from the same formula.

Although it is common for manufacturing pharmaceutical plants to require all weights, volume, etc., of the various ingredients to be checked by two people, preferably pharmacists, it is quite possible that such a procedure might not be feasible in a hospital pharmacy. However, it is prudent for all hospital pharmacies to check the yield of a batch of the finished product against the theoretical yield indicated by the formula. If the loss exceeds more than two or three percent in comparatively large batches of tablets, ointments, liquids, etc., it would seem to be necessary for the chief pharmacist to re-examine the entire processing of the batch to learn if the proper quantities had been weighed or measured. An over-yield is equally as objectionable as a short yield since it indicates improper care in the manufacture of the product.

Ordinarily, only glassware or ceramic utensils are employed in the preparation of a pint, quart, or pound of a preparation. However, a fifty-gallon batch requires some kind of a tank and usually a mechanical stirrer, a filter press, and tubing or pipe for transferring the liquid from one tank to the other. Thus the specifications of the portion of the equipment which comes in contact with the preparation becomes of prime importance. Perhaps I can best emphasize this point by an illustration. A company extracting a natural plant product with an acid solution discovered that the finished preparation contained relatively large amounts of metallic salts, principally iron, in spite of the fact that the extraction process was performed in glass lined equipment. An ash determination revealed that the natural product contained some iron, but not an amount sufficient to produce an extract with the high concentration of iron which was being obtained in the finished product. At first it was speculated that the natural product contained an iron compound which was not determined by the assay method. Later, upon carefully cleaning and inspecting the glass lined tank, it was discovered that there was a slight crack in the glass lining and that the acid solution

used in the extraction process had seeped into or through this opening where it could attack the iron under the glass lining to increase the iron concentration of the solution.

Accurate Measuring Devices

One of the causes for the manufacturing of a product with the improper ratio of ingredients is the use of inaccurate weights, scales, graduates, and other measuring devices. Every hospital pharmacy should, therefore, establish a policy of checking all weights, measuring devices, and balances at not more than six month intervals and preferably oftener to assure the proper degree of accuracy. This is one function which the hospital pharmacy is the best prepared to perform of any unit or division in a hospital.

It is generally agreed that most hospital pharmacies do not check the finished products which they manufacture to determine if they contain the amount of active ingredients which would be expected from the formula. Although the required amount of active ingredients may be used in the preparation of a product, this does not in any way guarantee the finished product will contain the specified quantities per unit weight or volume. If such were the case, manufacturing pharmaceutical companies and hospital pharmacies would not need to employ trained pharmacists since unskilled labor can weigh and mix as efficiently as highly skilled personnel. Then what are the various causes for preparations containing less or more than the specified amounts of various ingredients? First, the working formula may not have been copied properly so that the specified amounts were not used. Second, the weighing or measuring devices may not be accurate and hence the various ingredients will not be in their proper proportions. Third, there are usually mechanical losses in handling, mixing, etc. Fourth, some compounds are unstable and decompose or deteriorate during the manufacturing process. Fifth, there is always the chance for human error through mistaken identity, haste, and sometimes, carelessness.

On reviewing some issues of THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, I frequently noticed the statement that it is relatively easy to prepare some dosage forms of drugs which have caused many manufacturers considerable consternation. Some articles have appeared in which the author points out the savings to be derived by diluting more concentrated products to a lesser dilution. Obviously, one would expect no difficulty in diluting stable preparations like acids of the inorganic series, boric acid ointment, Dobell's solution, and other well-known, relatively stable products. On the other hand, there may be considerable risk in diluting any of the preparations which are not stable except under specified conditions. I refer specifically to the antibiotics, epinephrine, and certain specific vitamins. Further, the average hospital pharmacist does not have facilities for determining if the diluted product corresponds to the theoretically calculated strength or potency. Extreme caution should be observed in practices of this type.

Although it is relatively easy to manufacture some tablets, it is surprising how difficult it sometimes is to prepare other tablets within reasonable limits of a specified strength. Let me mention emetine hydrochloride tablets. I remember a hospital pharmacy in a teaching institution that was using the theoretical amount of emetine hydrochloride in the preparation of a tablet which, upon assay, contained only 86 percent of the labeled amount of emetine hydrochloride. After carefully examining the manufacturing process, and formula, it was discovered that the emetine hydrochloride contained approximately 14 percent moisture and hence the corresponding deficiency in the labeled strength occurred. Although the U.S.P. monograph permits emetine hydrochloride to contain not less than 8 and not more than 14 percent of moisture, the tablets in this specific instance were intended to contain 100 percent of the anhydrous chemical.

Although I readily agree that it may not be practical for a hospital pharmacist to assay every batch of every product that he prepares, I believe that every batch should be assayed until it has been demonstrated that the product prepared by that method contains the specified amount of active ingredients. The products could then be spot checked at various intervals to learn if they are meeting the standards established for the preparation.

Most of us think of manufacturing control as being limited entirely to the examination made by a control chemist. However, manufacturing control embraces a good deal more than that. It refers to the control and care which is used in the purchasing, procurement, and storage of raw materials and containers. It also refers to the control of the finished products, their processing into dosage forms, and their dispensing to the patient. Some authors refer to control care as embracing both quality control and identity control. It goes without saying that any hospital pharmacist carrying on a manufacturing process must of necessity carry on at least a limited amount of research and development to insure that he is preparing the best possible dosage form within the limits of his equipment and facilities. Every hospital pharmacist should give considerable thought to control so that the products and preparations which he manufactures will be of the highest quality.

a procedure for detecting the dilution of MEPERIDINE HYDROCHLORIDE in multiple dose vials

by

JAMES D. MCKINLEY, JR.

IN MANY HOSPITALS LARGE QUANTITIES of meperidine (Demerol) hydrochloride are used in multiple dose vials. These vials are used on several patients over a period of time varying from several hours to several days, depending on the amount of drug needed by the patients. With an opened vial on the nursing unit for possibly several days, and with three nursing shifts each day, there is divided responsibility which increases the possibility of tampering with the solution. The volume of solution in the vial is usually the only check made when the narcotics are checked from one nursing shift to another. Consequently, there exists the possibility that some nurse might take a quantity of the meperidine solution for her own use and dilute the remainder with an equal amount of water, so that the volume of solution in the vial would remain unchanged. Dilutions of more than 50 percent would have to exist before the patient's response would indicate a weak solution. Even then, one would still be in doubt as to whether the solution were actually being diluted or not.

The question, therefore, has been raised as to how the hospital pharmacy could easily determine whether or not the meperidine hydrochloride in the vials on the nursing units actually contain 50 mg. per ml. Upon inquiring of Winthrop Stearns, Inc. and the local office of the Bureau of Narcotics, it was learned that no simple test was available. But since meperidine hydrochloride is a weakly acid salt, it seemed practical to titrate it with sodium hydroxide. This is the basis for the following procedure which has proved successful in the M. D. Anderson Hospital Pharmacy. By routinely testing the "empty" vials as they are returned from the nursing units, one addict who was diluting the meperidine solution has been apprehended. This test is based on the use of 0.05 ml. of the solution to be tested; however, it has proved satisfactory with as little as 0.03 ml. of solution (the accuracy depending on the accuracy with which the 0.03 ml. is measured).

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Equipment Needed

1. One tuberculin syringe, 0.25 ml., graduated in 0.01 ml.
2. One 27 gauge, ½" hypodermic needle.
3. One pipette, 5 ml. graduated in 0.1 ml.
4. Two clean test tubes.
5. A stock bottle of Testing Reagent (Made from Distilled Water with exactly 45 mg. of sodium hydroxide and 1.0 ml. of 3 percent Bromsulphalein (Hynson, Wescott, and Dunning) per liter). This reagent should be freshly prepared, but can be kept for several weeks if bottled in small tightly closed containers.
6. One vial of meperidine hydrochloride, 50 mg. per ml. for use as a standard.

Procedure

1. Shake down the "empty" vial of meperidine hydrochloride so that the residual liquid collects in the neck of the bottle.
2. Insert the needle alongside the inner surface of the rubber stopper and withdraw slightly more than 0.05 ml.
3. Being careful that there are no air bubbles in the syringe or needle, adjust the volume in the syringe to exactly 0.05 ml and transfer the solution to a clean test tube by depressing the plunger of the syringe one time.
4. Rinse the syringe in distilled water and depress the plunger several times to remove all the water from the syringe and needle. Repeat steps No. 2 and No. 3 using the Standard Meperidine Hydrochloride Solution and place the Standard Solution in the second test tube.
5. Add exactly 5.0 ml. of the Testing Reagent (1.0 ml. for each 0.01 ml of the solution being tested) and compare the color of the solution.

Results

A diluted solution will be a darker shade of purple than the standard since there is less meperidine present to neutralize the sodium hydroxide. This test is sensitive to at least a 20 percent dilution without the aid of a spectrophotometer; however, if available, this instrument will increase the sensitivity. If an addict is using the meperidine and diluting it, there will usually be noted a dilution of 20 percent or greater.

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FORMULATION OF

LIQUID NUTRIENTS

FOR ORAL AND NASOGASTRIC FEEDING

by ANTHONY F. AIELLO *and*
ORVILLE H. MILLER

THE ADMINISTRATION OF PROPER AND ADEQUATE NUTRITION to the sick or injured who require special liquid feeding methods often presents a problem to the dietitian and physician. Tubal feeding with liquid nutrients may be required for patients who are in coma or semiconscious, patients in whom the deglutition mechanism is impaired by paralysis, obstructive lesions or jaw fracture, and for those unwilling or unable to eat for various other reasons. Similar liquid nutrients for oral use may be indicated where intake of regular foods is limited and particularly following a regimen of tubal feeding.

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Pollack and Halpern[1] with the collaboration of the Committee on Therapeutic Nutrition of the Food and Nutrition Board, National Research Council, have extensively reviewed the therapeutic aspects of proper nutrition. Acutely ill or injured patients are subject to rapid nutritional degradation and particularly when normal food intake is restricted. Nutritional requirements vary with the individual and should be estimated separately for each patient. Caloric requirements may vary from 2,000 to 5,000 calories per day. Protein requirements may vary from 70 grams to more than 300 grams per day. Fat and carbohydrate exhibit a protein sparing action and are essential to optimum nutrition. Fat emulsions are particularly useful in supplying high caloric requirements within a limited volume. Specific cases may require either a high or low fat or carbohydrate diet.

Water is not considered a nutrient yet it is a most essential constituent of the diet. The usual water intake should be about 2,000 ml. per day but may be much higher for febrile patients and those on high protein diets. High protein diets may prove quite dangerous if the water intake is not increased sufficiently to permit renal excretion of the increased solute load[2].

Vitamins, essential minerals, and the major electrolytes must also be considered and adjusted to the needs of the individual.

Liquid nutrients have been prepared from milk, skim milk, eggs, and dextrose syrups and from various proprietary preparations commercially available. These proprietary preparations consist mainly of whole or hydrolyzed protein with and without added carbohydrate. These protein concentrates may be combined with proprietary fat emulsions to increase the nutritional value and caloric content of the liquid formulas. A recent product combines hydrogenated oil, protein, and carbohydrate in a water dispersible powder.

Mixtures such as these proprietaries, while subject to modification, are not well suited for the preparation of the wide variety of liquid diets now prescribed. Separate protein, fat, and carbohydrate sources are needed to provide flexibility. These may then be combined in the desired proportions or used to fortify existing mixtures.

Pure carbohydrate sources such as dextrose, corn syrup, and cane sugar are readily available to the dietitian and present no problem.

The protein selected should be of high biological value and preferably bland in taste. Milk proteins are well suited for this purpose and are available in nutritious mixtures such as whole milk, fluid and powdered. An edible milk protein powder is also available. It is readily soluble in milk or water and can be used as a protein concentrate to fortify protein deficient mixtures. An oral casein hydrolysate powder may be used as a protein replacement in cases of intolerance to milk protein or impaired digestive function. Soy flour may be used as a milk substitute in case of allergy. Soy protein is superior to other vegetable proteins and approaches animal protein in biological value. The soy flour also provides a small amount of bulk to the diet which may or may not be desired.

A number of edible vegetable oils are available as sources of fat. Peanut oil, sesame oil, soy oil, cottonseed oil, olive oil, corn oil, and coconut oil are commonly used in foods. These oils without modification cannot be incorporated readily in liquid formulas. The addition of suitable emulsifiers will result in emulsification with a minimum of stirring. Best results are obtained when the emulsifiers are first dissolved in the oil. The following formula in which the ingredients are combined and mixed by stirring was found quite satisfactory.

Emulsifiable Oil

Edible Vegetable Oil	96.0 Gm.
Sorbitan Trioleate (Span 85*)	1.0 Gm.
Polysorbate 80 (Tween 80*)	3.0 Gm.

This Emulsifiable Oil is best prepared in the Pharmacy and the mixture supplied to the dietitian.

* Trade mark, Atlas Powder Company, Wilmington, Delaware.

These materials will provide the dietitian with sources of carbohydrate, fat, and protein suitable for the preparation of almost any desired liquid nutrient. The composition of these substances is listed in Table I.

TABLE I. COMPOSITION OF NUTRIENTS PER 100 GM.

NUTRIENT	CAL.	PROT.	FAT	CHO	CA	P
Whole Milk	68	3.5	3.9	4.9	0.118	0.093
Skim Milk	36	3.5	0.1	5.1	0.123	0.097
Skim Milk Pwd.	362	36	1.0	52	1.30	1.03
Milk Protein Pwd.[1]	364	60	1.5	28	1.20	1.10
Casein Hydrol.[1]	335	81	0.5	1.0	0.280	0.400
Soy Flour-Hi-Fat[2]	401	42	21	12*	0.200	0.530
Emulsifiable Oil	850	0	96	0	0	0
Dextrose	350	0	0	90	0	0

* Available Carbohydrate

1. Available from Sheffield Chemical Co., Norwich, New York.
2. Available from A. E. Staley Mfg. Co., Decatur, Illinois.

Experimental

A suitable tubal feeding formula must flow through the tube readily without plugging. The maximum concentrations of powdered nutrients

yielding such a free-flowing liquid when dispersed in water and milk was determined as a guide in formulation and appear in Table II.

TABLE II. MAXIMUM NUTRIENT CONCENTRATION YIELDING FREE-FLOWING LIQUID

POWDERED NUTRIENT	MAXIMUM % IN WATER	MAXIMUM % IN MILK
Casein hydrolysate	40	40
Lactalbumin hydrolysate	40	40
Skim milk powder (non-fat)	40	40
Milk protein powder, edible	30	30
Soy flour, Hi-fat	20	20

The high concentrations of nutrients that can be incorporated without excessive thickening make possible the preparation of very high caloric formulas. Satisfactory experimental formulas were prepared with over 4,000 calories per liter. Such a high caloric content is not required since additional water must also be given. A calorie content of about 2,000 calories is preferable and more convenient to prepare. Examples of the many possible variations in liquid diets prepared from these nutrients are presented in Table III.

Ordinary kitchen mixers such as found in the diet kitchen are adequate for mixing the several ingredients and emulsification. If intended for tubal feeding, straining or homogenization to remove small lumps may be desirable.

The formulas may be enriched with either water dispersible or oil solutions of vitamins if prescribed.

TABLE III. COMPOSITION OF TYPICAL LIQUID NUTRIENTS, IN GRAMS PER LITER

	General Utility Water Base	General Utility Milk Base	Low Carbohydrate	Low Fat	Milk Free
NUTRIENT					
Whole Milk		800	800		
Skim Milk				800	
Skim Milk Pwd.	100	200		200	
Milk Protein Pwd.			120	100	
Casein Hydrolysate					122
Soy Flour (Hi-Fat)	100				
Emulsifiable Oil	80	72	120		104
Dextrose	140	100			180
Water	780				892
TOTAL PROTEIN (or Equivalent)	77	100	100	159	100
TOTAL FAT	100	100	149	4	100
TOTAL CARBOHYDRATE	204	243	72	171	180
TOTAL CALORIES (Calories per Liter)	2012	2268	2000	1385	2004
CALCIUM	1.50	3.54	2.38	4.78	0.280
PHOSPHORUS	1.56	2.08	2.06	3.94	0.400

Vitamin oils such as cod liver oil should be added to the Emulsifiable Oil before mixing with the aqueous fluids. Mineral fortification is also possible but should not include ionizable iron salts. Soluble ferric phosphate, iron and ammonium citrate, or ferrous gluconate may be used. Flavors such as chocolate may also be added to the formulas if desired. This often improves the acceptability of the product for a short time, but may prove inadvisable for long-term feeding unless the flavor is varied frequently. The formulas as prepared are bland and pleasant to taste with the possible exception of those containing protein hydrolysate. Even in these formulas the presence of emulsified fat and carbohydrate seems to mask the usually objectionable taste of the hydrolysate.

These liquid nutrients are perishable and subject to spoilage if allowed to stand without refrigeration. They should be handled in the same manner as fresh milk. If unrefrigerated storage is contemplated, suitable preservatives and possibly antioxidants should be added.

A number of the liquid nutrient formulas described have been used to treat patients. They were well accepted and in several instances produced marked gain in weight. High fat formulas appeared to be well tolerated indicating that fat emulsions are better utilized than comparable quantities of non-emulsified dietary fats.

The cost of liquid nutrients based on the ingredients proposed is quite low, usually less than the cost of comparable nutrition from ordinary foods.

Summary

Liquid nutrients intended for oral or nasogastric tube feeding have been prepared from concentrated nutrients which may provide more than 2,000 calories per liter.

It is possible to supply widely variable amounts of protein, fat, and carbohydrate through the use of these formulas.

An "Emulsifiable Oil" composed of edible vegetable oils plus emulsifiers was used as the principal source of fat.

Vitamins, minerals, flavors, and preservatives may be added as desired.

The proposed formulas are readily prepared and generally more economical than comparable nutrition from ordinary foods.

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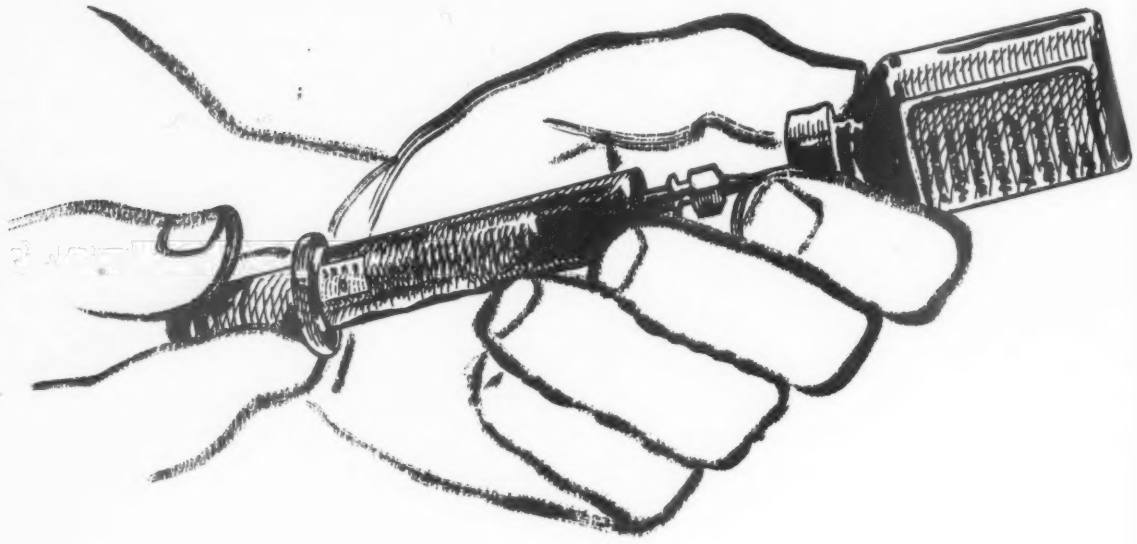
by WESLEY R. GLADHART, JR., RONALD M. WOOD *and* W. ARTHUR PURDUM



an evaluation of certain

BACTERIOSTATIC AGENTS

used in multiple dose vials sterilized by autoclaving

THE SATISFACTORY PRESERVATION OF PARENTERAL PREPARATIONS frequently poses a problem to the pharmaceutical chemist and hospital pharmacist. It is a problem of considerable complexity. Efforts directed toward its solution have provoked much speculation and experimentation for many years.

This paper is abstracted from a thesis submitted by WESLEY GLADHART, JR. to the Graduate School, University of Maryland in partial fulfillment of the requirements for the degree of Master of Science. Mr. Gladhart is now at the U.S.P.H.S. Hospital in Seattle, Washington. RONALD W. WOOD is Associate Professor of Ophthalmology and Assistant Professor of Microbiology, The Johns Hopkins University, Baltimore, Maryland. W. ARTHUR PURDUM is Chief Pharmacist, The Johns Hopkins Hospital and Professor of Hospital Pharmacy, University of Maryland, Baltimore, Maryland.

The history of the use of parenterals is interesting in that although the idea was first conceived centuries ago, its success awaited the development of a satisfactory method of administration as well as the availability of sterile and stable preparations. These problems were not solved satisfactorily until recent years.

The first authentic instance of blood transfusion was that performed in England by Richard Lower of Cornwall in 1665.[1] In May 1844 the Irish surgeon Rynd became the first man to introduce fluids subcutaneously. At sometime between Rynd's work and 1853 was the invention of a simple syringe with a hollow needle.[2]

Pfender[2] states that during the early days of hypodermic medication serious complications resulted from injections. A review of the literature

from 1870 to 1900 showed the number of accidents was exceedingly large during the decade from 1870 to 1880.

In an attempt to avoid these complications and to prevent decomposition of the medication, such substances as glycerin and chloral hydrate were added to the preparations as antiseptics. Their use, however, was abandoned because of the pain that was produced upon injection.[2] As an alternative, powders or tablets consisting of sodium chloride together with the drug were prepared and fresh solutions were made up immediately before administration.[2]

In 1911 several workers[3, 4] discovered the relationship of pyrogens to febrile reactions. Once aware of the existence of pyrogens and of the necessity for aseptic precautions at the time of administration, physicians began to use the hypodermic syringe more extensively. The growth of molds and bacteria in preparations subjected to prolonged periods of storage, as well as the use of multiple-dose containers which are subject to possible repeated contamination, demonstrated the need for the use of antimicrobial agents so that the preparations would remain sterile. One of the earliest and still widely used agents for this purpose is phenol.[5]

Today a large number of agents are available for this purpose. The very fact that such a variety of bacteriostatic agents are used in commercial multiple-dose vials implies that there is no single substance satisfactory for use in all pharmaceutical preparations. Such is indeed the case.

Desirable Characteristics

There is general agreement that the ideal bacteriostatic agent should have the following characteristics:

1. Effectiveness against all types of microorganisms.[6]
2. Solubility in the concentration employed.[6]
3. Absence of toxicity where used and in the concentration used.[6]
4. Compatibility. The preservative should not alter the character of the preparation and should be practically neutral so that it will not alter the *p*H of the preparation.[6]
5. Stability during storage[6] and during heat sterilization.
6. Effectiveness over a reasonable range of *p*H.
7. Chemically non-reactive with the medicament.

Some of the factors influencing the activity of the bacteriostatic agents under conditions of use are:

1. Amount of nutrient present in the medicament itself capable of supporting microbial growth.
2. *p*H of the product.
3. Substances present which interfere with or alter the bacteriostatic activity of the agent.
4. Presence of compounds which are inherently bacteriostatic or fungistatic.
5. Microorganism(s) involved.

It has been shown that liquid medicinals having a *p*H lower than 3.0 or higher than 11.0 provide hydrogen or hydroxyl ions which have a distinct inhibitory action against yeasts, molds and many of the pathogenic bacteria.[7] In parenteral preparations these extremes are not considered desirable. Some pharmaceutical manufacturers believe that solutions for injection are safe if in the *p*H range of 4 to 9; this range is considered safe provided the

TABLE 1

pH DETERMINATIONS ON MEDICATED SOLUTIONS WITH AND WITHOUT CHLOROBUTANOL

BEFORE AND AFTER AUTOCLAVING

Drug Solution	pH Values			
	Drug Alone		Drug with Chlorobutanol	
	Before Autoclaving	After Autoclaving	Before Autoclaving	After Autoclaving
Water	6.61	6.79	6.83	2.68
Pyridoxine Hydrochloride 50 mg./ml.	2.78	2.75	2.78	2.69
Atropine Sulfate 1 mg./ml.	6.71	6.29	6.86	3.09
Morphine Sulfate 20 mg./ml. in N/1000 HCl	3.66	3.38	3.90	3.15
Meperidine Hydrochloride 50 mg./ml.	5.48	5.34	5.46	3.19
Potassium Chloride 10%	6.27	8.35	6.43	3.46
Dextrose 33-1/3%	6.44	4.44	6.94	3.90
Magnesium Sulfate 50%	6.23	6.17	6.39	4.72

dose is of the order of a few milliliters. When large volumes of solution are to be injected the *p*H should be close to 7.4 preferably.[8]

Scope of Study

The preparation by a hospital pharmacy of a variety of parenteral solutions in multiple-dose vials is simple if the drug, preservative, and solvent may be mixed, filtered, bottled, and autoclaved in that order. This procedure requires a minimum of time and equipment to supply an initially sterile, quality product.

The success of such a procedure depends upon the availability of a bacteriostatic agent which is heat stable at autoclave temperatures and at the same time compatible with the drugs to which it is added. The agent should also meet the other requirements listed previously. The present study was undertaken to determine:

1. The sterility of multiple-dose vials after the last dose has been withdrawn for administration. This survey was limited to parenterals prepared in the Pharmacy Department of The Johns Hopkins Hospital and from which an indeterminate number of doses had been withdrawn.
2. The stability of several antimicrobial agents after autoclaving.
3. The activity after autoclaving of several antimicrobial agents incorporated in parenteral preparations.

At the time of the investigation, chlorobutanol was used routinely in those injections whose monographs in official compendia allowed the use of a bacteriostatic agent.

Survey of Sterility

In the survey of the sterility of multiple-dose vials after use, a total of 601 vials was cultured for sterility. Of this number, 4.5 percent were found to be contaminated with one or more organisms. Two and eight-tenths percent of the vials were contaminated with Gram-negative bacilli including *Escherichia coli, Proteus,* and *Pseudomonas.* Of 91 vials of Atropine Sulfate Injection, 14 (15.4 percent) were found contaminated. Water for Injection showed a contamination rate close to that of the total collection. Although less than half of all the vials contained chlorobutanol, it is interesting to note that the atropine injection did contain it.

Consequently this phase of the study dramatically demonstrated what can happen to multiple-dose vials not adequately preserved.

Deficiencies of Chlorobutanol

Although chlorobutanol is compatible with a large number of chemicals and is used extensively, Taub and Luckey[9] showed that at 65°C., it decomposes releasing hydrochloric acid. The reactions occurring have been studied by Ray and Basu.[10] Gershenfeld has shown that 0.5 percent chlorobutanol solution displayed bacteriostatic properties against non-spore forming as well as spore forming bacteria in broth cultures and aqueous suspensions. After heat processing, using sterilizing temperatures, all dilutions failed to show bacteriostatic properties against any of the test organisms or spores.[11]

TABLE 2

pH VALUES OF ANTIMICROBIAL AGENTS BEFORE AND AFTER AUTOCLAVING

	Concentration	pH Before Autoclaving	pH After Autoclaving
Chlorobutanol Hydrous U.S.P.	0.5%	7.04	2.30
Phenylmercuric Nitrate	0.002%	6.92	7.69
Phenol Reagent	0.5%	6.83	7.29
Benzyl Alcohol	1.5%	7.26	7.89
Paraben Combination: Methyl Paraben Propyl Paraben	0.15% 0.03%	5.79	5.83
p-Chloro-m-cresol	0.25%	6.83	7.09
Benzethonium Chloride	0.01%	7.15	7.30
Hyamine 10-X	0.01%	7.13	7.13

pH Changes in Chlorobutanol Solutions upon Autoclaving

In our study it was found that the addition of chlorobutanol to solutions of various drugs did not appreciably alter the *p*H of the solutions. However, after autoclaving at 121.5°C. (15 pounds pressure) for 15 minutes, solutions containing the chlorobutanol almost invariably possessed significantly lower *p*H values. The results are summarized in Table 1.

These findings emphasized that the addition of chlorobutanol to solutions subsequently autoclaved was not only irrational, but potentially dangerous. Consequently, an investigation was undertaken to find an antimicrobial agent which would retain its activity after autoclaving. Seven agents and one combination of agents found in commercial injections were selected for the tests. These and the respective concentrations employed were:

Antimicrobial Agent	Concentration
Phenol	0.5 %
Paraben Combination:	
Methyl Paraben	0.15 %
Propyl Paraben	0.03 %
p-Chloro-m-cresol	0.25 %
Chlorobutanol	0.5 %
Benzyl Alcohol	1.5 %
Phenylmercuric Nitrate	0.002%
Benzethonium Chloride*	0.01 %
Hyamine 10-X**	0.01 %

*Benzyldimethyl -{2-[2-(p-1,1,3,3 - tetramethylbutylphenoxy) ethoxy] ethyl} ammonium chloride monohydrate. Known commercially as Phemerol Chloride (Parke, Davis and Company) and as Hyamine 1622 (Rohm and Haas Company).

**Rohm and Haas Company Trade Name for Benzyldimethyl -{2-[2-(*p*-1,1,3,3, - tetramethylbutylcresoxy) ethoxy] ethyl} ammonium chloride monohydrate.

pH Changes in Antimicrobial Solutions after Autoclaving

Aqueous solutions of the compounds listed above were prepared and *p*H determinations were made before and after autoclaving at 121.5°C. (15 pounds pressure) for 20 minutes. As shown in Table 2, none of the compounds showed as marked a shift in *p*H as did chlorobutanol. It was, therefore, decided to determine if these agents still possessed antibacterial activity following heat sterilization.

An Evalutaion of the Antimicrobial Activity of Solutions before and after Autoclaving

Solutions of each compound and of the paraben mixture were prepared in distilled water as in the previous experiment. In addition, dextrose solution, 5.6 percent, was prepared and adjusted to *p*H 2.3 with 0.2N HCl. This represented a solution of the same *p*H as autoclaved chlorobutanol and served to give an indication of the effect of *p*H on the test organisms.

TABLE 3
ACTIVITY OF ANTIMICROBIAL AGENTS BEFORE AND AFTER AUTOCLAVING

Compound	Treatment	Test Organism							
		Staph. Aureus Count* At				E. Coli Count* At			
		0 Time	15 Min.	60 Min.	24 Hrs.	0 Time	15 Min.	60 Min.	24 Hrs.
p-Chloro-m cresol	Filtered	122	**	**	**	138	**	**	**
	Autoclaved	122	**	**	**	138	**	**	**
Hyamine 10-X	Filtered	131	**	**	**	140	**	**	**
	Autoclaved	131	**	**	**	140	**	**	**
Benzethonium Chloride	Filtered	131	29	**	**	140	**	**	**
	Autoclaved	131	**	**	**	140	**	**	**
Phenylmercuric Nitrate	Filtered	82	92	90	**	148	108	76	**
	Autoclaved	82	82	87	**	148	84	84	**
Paraben Combination	Filtered	95	93	91	1	155	57	8	**
	Autoclaved	95	86	66	**	155	83	11	**
Phenol	Filtered	82	118	101	2	148	121	77	**
	Autoclaved	95	78	85	**	123	114	101	9
Benzyl Alcohol	Seitz Filt.	107	104	96	8	123	103	87	**
	Autoclaved	63	56	57	16	123	100	92	**
Chlorobutanol	Filtered	81	77	88	54	134	105	99	31
	Autoclaved	81	62	67	1	134	129	117	112
Dextrose + HCl	Filtered	145	138	136	91	138	124	145	116

*Multiply numbers in table by 10^7.
**Less than 1 million per ml.

The test organisms were *Staphylococcus aureus* and *Escherichia coli*. These organisms were strains freshly isolated from patients in the hospital and were chosen as representative of a Gram-positive coccus and a Gram-negative bacillus most likely to occur as contaminants of parenteral solutions on hospital wards.

The same strains were used in testing all the compounds. To 9 ml. of each solution, 1 ml. of a 19 hour broth culture of the test organism was added. At intervals of 15 minutes, 1 hour and 24 hours, decimal dilutions were poured from the 10^6 and 10^7 dilutions to determine the count at each interval of time. Control counts were run on the broth culture in parallel with each set of determinations. The plates were read after 24 hours. If no growth appeared at that time the plates were re-incubated and examined again after 72 hours.

There were no dramatic changes in the activities of the agents tested after being subjected to the conditions of autoclaving. The results are summarized in Table 3. As nearly as can be determined by the results, the agents are listed in the approximate order of decreasing activity. The Hyamines and *p*-chloro-*m*-cresol are far more efficient than the others. The figures for the acidified dextrose solution lead to the assumption that part of the activity of autoclaved chlorobutanol may be attributed to its acidity.

A preliminary investigation of the compatibility of benzethonium chloride 0.01 percent and Hyamine 10-X with various injectible medications was made. At the end of four weeks, the quaternary compounds appeared to be compatible with seven medicaments and incompatible with seven as shown in Table 4. Clarity to the unaided eye was regarded as the criterion of compatibility.

It should be noted that Valko and Dubois[12] showed that benzethonium chloride can be easily inactivated by a variety of substances, including protein and anions of high molecular weight.

Antimicrobial Activity of Benzethonium Chloride after Incorporation with Selected Medicinals

Medicinal solutions containing benzethonium chloride were prepared in the same manner as before, autoclaved as usual and tested for bacteriostatic activity according to the procedure outlined earlier. Table 5 shows that the antibacterial activity of benzethonium chloride remained satisfactory in all solutions except that of mag-

TABLE 4

PHYSICAL COMPATABILITY OF BENZETHONIUM CHLORIDE AND HYAMINE 10-X WITH MEDICAMENTS

		When Mixed		24 Hours Later		Immediately After Autoclaving		24 Hours Later		2 Weeks Later		4 Weeks Later	
	Gm./100 ml.	B	10X	B	10X	B	10X	B	10X	B	10X	B	10X
Atropine Sulfate	0.1	C	C	C	C	C	C	C	C	C	C	C	C
Caffeine Sodium Benzoate	1.6	+	++	+	++	+	++	+	++	sl ppt	sl ppt	sl ppt	ppt
Dextrose Anhydrous	33.3	C	C	±	±	+	+	±	+	±	±	±	±
Ephedrine Hydrochloride	5.0	C	C	+	C	+	+	±	±	C	C	C	C
Histamine Diphosphate	0.05	C	C	C	C	C	C	C	C	C	C	C	C
Magnesium Sulfate	50.0	C	+	ppt	+	C	+	C	++	ppt	ppt	ppt	ppt
Meperidine Hydrochloride	5.0	C		±		C		±		C		C	
Morphine Sulfate	2.0	C		±		C		±		C		C	
Pontocaine Hydrochloride	2.0	C	C	C	C	C	±	C	C	sl ppt	sl ppt	ppt	ppt
Potassium Chloride	10.0	+++	++	+++	++	+++	+++	+++	+++	+++	+++	+++	+++
Procaine Hydrochloride	4.0	C	C	C	C	C	C	C	C	C	C	C	C
Pyridoxine Hydrochloride	5.0	C	±	C	±	C	C	C	C	sl ppt	sl ppt	ppt	ppt
Sucrose	50.0	C	C	C	C	C	C	C	C	C	C	C	C
Thiamine Hydrochloride	10.0	C	±	C	C	+	C	C	++	C	++	sl ppt	ppt

KEY: B=Benzethonium Chloride C=Clear ±=Very Slight Cloudiness

10X=Hyamine 10-X ppt=Precipitation +=Turbid

TABLE 5

ANTIBACTERIAL ACTIVITY OF BENZETHONIUM CHLORIDE AFTER AUTOCLAVING WITH VARIOUS PARENTERAL PREPARATIONS

Drug Plus Benzethonium Chloride 0.01%	Test Organism							
	S. Aureus Count* At				E. Coli Count* At			
	0 Time	15 Min.	60 Min.	24 Hrs.	0 Time	15 Min.	60 Min.	24 Hrs.
Atropine Sulfate	1280	**	**	**	1250	**	**	**
Dextrose	1280	**	**	**	1250	**	**	**
Histamine Diphosphate	1320	125	**	**	1470	**	**	**
Magnesium Sulfate	1320	**	**	**	1470	1300	1065	535
Meperidine Hydrochloride	1280	**	**	**	1250	**	**	**
Morphine Sulfate	1280	19	**	**	1250	**	**	**
Procaine Hydrochloride	1490	34	1	**	1470	**	**	**
Pyridoxine Hydrochloride	1320	2	**	**	1470	93	16	**
Thiamine Hydrochloride	1490	1	**	**	1745	**	**	**
Sucrose	1490	**	**	**	1745	17	1	**

*Multiply figures in Table by 10^6.
**Less than 10^6 organisms per ml.

nesium sulfate. This is not surprising because precipitation was observed in the solution within two weeks.

Further investigation is needed to find effective preservatives for those medicinal agents with which benzethonium chloride was found to be incompatible.

Conclusions

1. Chlorobutanol, because of its instability upon autoclaving, is not a safe antibacterial agent to add to parenteral preparations prior to autoclaving.

2. Seven antibacterial agents and one combination of agents were examined for bacteriostatic activity before and after autoclaving. It was found that benzethonium chloride, Hyamine 10-X and *p*-chloro-*m*-cresol were superior to the others in the concentrations employed. Benzethonium chloride 0.01 percent is the agent of choice in those parenteral solutions with which it is compatible

3. Benzethonium chloride 0.01 percent was found to be compatible with atropine sulfate, ephedrine hydrochloride, histamine diphosphate, meperidine hydrochloride, morphine sulfate, procaine hydrochloride, and sucrose.

4. It is recommended that this work be continued in order to find suitable preservatives for those medicinal agents which are incompatible with benzethonium chloride.

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ABOVE: Opening Session of the General Assembly. LEFT: The Bureau of the Federation—FRONT ROW, LEFT TO RIGHT: Dr. J. W. Birza, Dr. R. Fabre, Sir Hugh Linstead, Dr. D. Van Os, and Dr. H. Spillmann; BACK ROW, Dr. M. P. Degand, M. R. Boitias, and Dr. U. Gallo. LOWER LEFT: Dr. Don E. Francke, Mrs. J. Cheymol, Dr. J. Cheymol, Dr. Host Madsen, and Delegate from Yugoslavia. LOWER RIGHT: Receiving line at the Monday night reception—Mr. H. Steinman, Mrs. Steinman, Sir Hugh Linstead, Lady Linstead, Mrs. D. Hudson, and Mr. D. Hudson.

International Pharmaceutical Federation Meets in London, 1955

FORTY-FOUR COUNTRIES were represented by 1,096 delegates and participants at the 16th General Assembly of the International Pharmaceutical Federation meeting in London, September 17-23. The American Delegation, headed by A.Ph.A. President Jack Heinz, numbered approximately thirty. President Heinz also represented the American Pharmaceutical Association at the meeting of the Council of the F.I.P. and Dr. Don E. Francke continued to serve on the Council as the representative of the Press and Documentation Section. The AMERICAN SOCIETY OF HOSPITAL PHARMACISTS was represented with approximately ten members in attendance. President Claude Busick, Secretary Gloria Niemeyer and the Editor of THE BULLETIN, Don E. Francke, served as official representatives of the SOCIETY.

Pharmacists from the U. S. participated in the various sections including the University (Scientific) Section, the Section of Military Pharmacists, the Press and Documentation Section, the Directors of Control Laboratories, the Section of Pharmacopoeial Commissions, the Union Mondiale des Sociétés d'Histoire de la Pharmacie, and the Section of Hospital Pharmacists. Among the papers by pharmacists from the U.S. was one entitled "The Bowl of Hygeia as a Pharmacy Symbol," which was presented by Dr. Glenn Sonnedecker, Secretary of the American Institute of the History of Pharmacy. Also, a paper entitled "Publications of the International Pharmaceutical Federation," by Don E. Francke, was presented at the Press and Documentation Section.

Also of particular interest to pharmacists in the U.S. was presentation of the Urdang Medal to Dr. Rafael Folch Andreu of the University of Madrid for his work on the history of pharmacy. The medal, established in honor of Dr. George Urdang of the American Institute of the History of Pharmacy was presented by Dr. Glenn Sonnedecker.

A detailed account of the Section of Hospital Pharmacy is included later in this report and summaries of some of the papers presented to this Section will be published in a forthcoming issue of THE BULLETIN.

Meetings were held at the Senate House at the University of London and at Friends House. At the sessions of the General Assembly, simultaneous translations were made in several languages.

In addition to the general meetings and the several special exhibits, mention should be made of the social activities during the week—all of which were outstanding and so well planned by the Committees of the Pharmaceutical Society of Great Britain to whom a very special thanks is due. The trip on the Thames River—the performance of Mozart's "Magic Flute" in the South Bank Festival Hall—the visits to British Pharmaceutical firms—and the Banquet and Ball at Grosvenor House—were all happy occasions.

The British pharmacists are to be commended for their thorough planning and work in connection with the Federation meeting. Many individuals contributed their entire week to guiding visitors and acting as hosts. British pharmacists and the Pharmaceutical Society will long be remembered in connection with this occasion—the 16th General Assembly of the International Pharmaceutical Federation.

At the closing session on Friday, A.Ph.A. President Heinz expressed sincere thanks and appreciation to the Pharmaceutical Society in the name of the countries participating. At the same time he brought greetings from the American Pharmaceutical Association and the pharmacists of the United States.

The General Assembly

At the General Assembly of the Federation meetings, papers of broad interest are presented and the business affairs transacted. Two sessions were held during the week with the opening meeting on Monday highlighting the program. At this time the Minister of Health, the Rt. Honorable Ian Macleod, M.P., and the President of the Pharmaceutical Society. Mr. Harry Steinman, brought greetings.

Sir Hugh Linstead, President of the F.I.P., presided over the meetings throughout the week and presented his Address at the closing session on Friday. In concluding, he stated:

"At a time when the profession was fighting against industrialization and commercialization, against the cult of the specialty and the doctrine that in many fields the machine could replace the men, they must put up the sternest fight against any development that might turn them from professional men to technicians. The public could not be protected against commercial exploitation or against Government exploitation (for that too

could happen) by political or economic weapons. In the long run the only sure protection of the public was the knowledge and integrity of the individual pharmacist. It was he who must have the courage to put his own conscience and the standards and traditions of his profession as a shield between the sick and exploitation."

Among the papers presented to the General Assembly was one on "The Relations Between the World Health Organization and the Fédération International Pharmaceutique," by Mr. P. Blanc, Chief of the Pharmaceutical Section of the World Health Organization. The work of WHO in making possible the *International Pharmacopoeia* was outlined, pointing out the need for liaison with the International Pharmaceutical Federation. In closing, Mr. Blanc presented the President with an advance copy of Volume II of the first edition of the *International Pharmacopoeia.*

A paper on "The Survival of Retail Pharmacy," brought out some of the problems facing retail pharmacists today. The report, presented by Dr. Viktor Hauser (Austria), was the result of a questionnaire sent to member countries of the Federation. Questions related to the effect of sickness benefit societies, licensing pharmacies, salaries, and other problems.

In a paper entitled "The System of District Pharmacies in Sweden," a plan was outlined whereby pharmacies are under government control with a central manufacturing and purchasing headquarters. In describing the plan, Apothekare G. Kallrot, Chief of the Planning Department, Apothekersocieteten, Sweden, pointed out the advantages of the system and the method of operation.

Another highlight of the General Assembly meetings was presentation of a medal created in recognition of Dr. Host Madsen's services to the Federation. In presenting the medal to Dr. Madsen, Sir Hugh Linstead spoke of the recipient's long service to the Federation.

Business covered by the Council and brought to the attention of the General Assembly during the week included the following:

—Appointment of Dr. H. Spillmann (Switzerland) as the liaison officer with the World Health Organization.

—Unification and integration of the Constitutions and By-Laws of all sections of the F.I.P. with that of the parent organization.

—Election of new members of the Bureau including Prof. S. Schou (Denmark) and Prof. Krause (Germany).

—Establishment of a Commission to study the practice of pharmacy in retail stores.

—Approved establishment of a Manufacturers' Section.

—Acceptance of the Pharmaceutical Society of Poland as a new member of the F.I.P.

—Announced plans for holding a meeting of the General Assembly of the Federation in Brussels in 1958.

On behalf of the A.Ph.A., President Heinz presented an invitation to the Council and members of the F.I.P. to attend the Pan-American Congress of Pharmacy which is to be held in Washington in the Fall of 1957. The A.Ph.A. also invited the F.I.P. to hold its General Assembly in the U.S. in 1960. The latter was referred to the Bureau of the F.I.P. for consideration.

Section of Hospital Pharmacists

Meetings of the Section of Hospital Pharmacists of the International Pharmaceutical Federation were held in conjunction with the 16th General Assembly. The Section, under the leadership of Dr. J. Cheymol (France), was well organized with approximately 100 hospital pharmacists participating.

Delegates were present from seventeen countries having membership in the Section. These included Austria, Belgium, Canada, Denmark, France, Germany, Great Britain, Holland, Israel, Japan, Yugoslavia, Lebanon, Norway, Spain, Sweden, Switzerland, and the United States. In addition, there were hospital pharmacists present from Norway, Japan and Ireland and representatives of these countries were invited to participate in the final meeting of the Council.

The meetings of the Council were well conducted with translations in German, French and English by the officers.

A delegation of approximately ten hospital pharmacists from the U. S. was headed by President Claude Busick. In addition to Mr. Busick, Miss Gloria Niemeyer, Secretary of the ASHP, participated in the Council meetings. Dr. Don Francke who has worked with the members of the Bureau since the Section was organized in Rome in 1951, was elected a Vice-President of the Section.

Business transacted by the Council included changes in the Constitution and By-Laws as proposed by the Bureau of the Federation, payment of the annual fee to assist in carrying out the secretarial duties, and the relationship of the Section with the Federation with particular reference to membership. There was also discussion regarding the conflict in the meetings of the hospital pharmacy Section and the University (Scientific) Section and the types of papers presented. This was called to the attention of the Bureau of the Federation and Prof. Schou (Denmark) was named liaison with the University Section.

Papers Presented

Most papers presented to the Section of Hospital Pharmacists were supplied in mimeographed form in two or more languages. However, simultaneous translation facilities were not available. Papers were well accepted. It was suggested that at future meetings more papers be devoted to the professional aspects of hospital pharmacy practice.

Among the papers presented to the Section of Hospital Pharmacists were the following:

Symposium: "The Preparation of Injectable Fluids"

(a) Preparation of Infusion Fluids by Dr. E. Soos, Austria.
(b) Pyrogens by M. Dorche, France.
(c) Closures and Containers by Prof. K. Steiger, Switzerland.
(d) Sterilization of Injectable Solutions (the Problem of Pre-heating) by Dr. F. Martin, Belgium.

Symposium: "The Absorption of Medicaments by Various Routes of Administration"

(a) Absorption of Ointment Bases by Mr. J. W. Hadgraft, Great Britain.
(b) The Influence of the Route of Administration and of the Vehicle on the Absorption of An Alkaloid (Eserine) by Prof. R. Cavier, France.
(c) Absorption by the Rectal Route by Dr. M. B. Gradnick, Italy.

"Hospital Pharmacy. A Means of Professional and Cultural Advancement" by Dr. P. Ucelli, Italy.

"The Preparation, Activity and Preservation of Tinctures of Digitalis" by Prof. R. San Martin, Spain.

Special Events for Hospital Pharmacists

The Guild of Public Pharmacists (the hospital pharmacists' organization in Great Britain) entertained at a dinner on Tuesday night at the University College Medical School in London—an institution where a number of leading pharmacists have served. Among these have been Sydney Ringer (known for Ringer's Solution), W. Martindale, C. H. Hampshire, and Harold Davis, who is now Chief Pharmacist in the Ministry of Health. The present pharmacist, Mr. T. D. Whittet, is a leader among hospital pharmacists in Great Britain.

With approximately 100 members of the Section of Hospital Pharmacists present, the guests were received by the President of the Guild of Public Pharmacists by Mr. A. M. Mees and Mr. T. D. Whittet. Acting Toastmaster was the General Secretary of the Guild, Mr. John Moore. Leading the guest list was the President of the F.I.P., Sir Hugh Linstead and Lady Linstead; and the President of the Pharmaceutical Society of Great Britain, Mr. H. Steinman, and Mrs. Steinman.

Proposing the toast, "Our Overseas Guests," Mr. Mees mentioned leaders in hospital pharmacy from over the world who were present. He pointed out that though pharmacy practice may differ in different lands, in the field of hospital practice, there is greater opportunity for common interests.

In replying to the toast, Prof. S. Schou of Denmark expressed the belief that the hospital pharmacist is becoming the center of the pharmaceutical world. He pointed out that hospital pharmacists are the "true practicing pharmacists" and our Section could play an important role in the F.I.P.

Mr. Whittet, in proposing the toast to "La Federation Internationale Pharmaceutique," spoke of the value of an international gathering such as the F.I.P. Assembly. He recalled past meetings of the Federation and the growth of the Section of Hospital Pharmacists. He also paid tribute to Sir Hugh Linstead. Sir Hugh and Prof. J. Cheymol, President of the Section, responded.

The toast to the University College Hospital Medical School was proposed by Dr. H. Davis of the Ministry of Health, and was replied to by Prof. M. Rosenheim, Professor of Medicine at the School, in the absence of the Dean, D. J. D. S. Flew and the Secretary, Major-General H. L. Binks.

Hospital pharmacists were also entertained on Thursday evening at the Wellcome Building where a buffet was served and the Museum and Library were open for inspection A special exhibition on the history of pharmacy had been arranged for the F.I.P. Meeting by the Wellcome Historical Medical Museum.

Officers of the Section of Hospital Pharmacists who will serve through the 1958 meeting are President, Dr. J. Cheymol (France); Vice-President, Dr. H. Lehmann (Switzerland); Vice-President, Dr. Don E. Francke (U.S.A.); and General Secretary, Mr. Bert Grainger (Great Britain).

Among the members of the delegation were the following:

Col. Bernard Aabel, Washington, D. C.; Dr. and Mrs. Allen H. Bunce, Atlanta, Ga.; Mr. and Mrs. Claude Busick, Stockton, Calif.; Mrs. Thelma Morris Coburn, Birmingham, Ala.; Miss Hilda Colunga, New York, N. Y.; Miss Marie Conti, Long Island, N. Y.; Mr. and Mrs. Jack Cooper, Summit, N. J.; Mr. and Mrs. Thomas A. Foster, Washington, D. C.; Dr. Don E. Francke, Ann Arbor, Mich.; Miss Goldie Goldman, Brooklyn, N. Y.; Miss Irma Gotthelf, New York, N. Y.; Mr. George Griffenhagen, Washington, D. C.; Mr. and Mrs. Jack Heinz, Salt Lake City, Utah; Dr. Lloyd C. Miller, New York, N. Y.; Dr. and Mrs. James C. Munch, Lansdowne, Pa.; Col. Howard B. Nelson, Paris, France; Miss Gloria Niemeyer, Washington, D. C.; Miss Lydia Schick, Brooklyn, N. Y.; Mr. and Mrs. Eli Schlossberg, Phoenix, Ariz.; Dr. and Mrs. Glenn Sonnedecker, Madison, Wis.; Mr. and Mrs. Newell Stewart, New York, N. Y.; and Mr. Norbert Wegemer, Petoskey, Mich.

ABOVE: *Discussion period at the Atlanta Institute.* LEFT TO RIGHT: *I. Thomas Reamer, Albert P. Lauve, Gilbert Colina, Claude Busick, and Grover C. Bowles.* BELOW: *Group photo of enrollees and faculty at Atlanta Institute.*

ATLANTA INSTITUTE

HOSPITAL PHARMACISTS from throughout the country participated in the Institute held at Emory University, Atlanta, during the week of August 22. The fact that this was one of the smallest groups ever to attend an institute offered an unusual opportunity for group participation. Enrollees came from 24 states and the District of Columbia and represented hospitals ranging in bed size from 65 to more than 1,200. One-third of the group was from government institutions and the other two-thirds represented non-profit hospitals. Approximately one-half of the enrollees were chief pharmacists and the other half assistant chiefs or staff pharmacists.

Welcome from Participating Groups

At the opening session on Monday, Dr. Goodrich C. White, President of Emory University, welcomed the Institute enrollees. Mr. Burwell W. Humphrey, Superintendent of Emory University Hospital and President-Elect of the Georgia Hospital Association, brought greetings. In addition to the above, representatives of the sponsoring organizations—the American Hospital Association, the American Pharmaceutical Association, the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, and the Southeastern Society of Hospital Pharmacists—all brought greetings.

Special mention of the work of the hospital pharmacists in Atlanta and members of the Southeastern Society of Hospital Pharmacists should be made. Mrs. Lillian Price, Chief Pharmacist at Emory University Hospital, and Miss Johnnie Crotwell, Chief Pharmacist at Georgia Baptist Hospital, were responsible for arranging many of the details. Also, Mr. Terry Nichols, President of the Southeastern Society, contributed much toward the success of the Institute. A Social Evening on Monday night was sponsored by the Southeastern Society. Entertainment, dancing and refreshments offered an opportunity for those attending the Institute to become acquainted.

During the week arrangements were made for those attending the Institute to visit the Southern College of Pharmacy in Atlanta and the Pharmacy Departments at Emory University Hospital and Georgia Baptist Hospital.

Faculty members came from all parts of the country and represented leaders in pharmacy, hospital administration, public health, and the various allied medical fields. Highlights of the meetings included discussions on radioisotopes, electrolytes, and laws pertaining to hospital pharmacy practice. Also, keen interest was shown in the discussions on hospital formularies, effective communication, and principles of administration.

Following greetings from the heads of the participating organizations, the Monday morning sessions included papers covering the broad aspects of "Hospital Pharmacy and the Public Health," by Dr. Robert P. Fischelis, Secretary of the American Pharmaceutical Association, and "The Role of Pharmacy Service in Hospital Care," by C. J. Vance, Administrator of South Highlands Infirm-

ABOVE: *Mrs. Lillian Price, Chief Pharmacist at Emory University Hospital and Dr. Douglas Johnson of the Southern College of Pharmacy examine apparatus for handling radioisotopes.* BELOW: *Institute enrollees during one of the sessions at Atlanta.*

Pharmacists from VA Hospitals attending Atlanta Institute.

ary in Birmingham, Ala. During the afternoon session, Dr. Robert R. Cadmus, Chairman of the American Hospital Association's Committee on Professional Practice, discussed "Fundamentals of Administration." He pointed out the need for blending professional and administrative duties with a goal toward "providing good sound pharmaceutical service." He suggested the following steps in performing administrative duties: planning, organizing, assembling resources, directing, and control. This was followed by a panel discussion with an opportunity to cover problems concerned with administration of the Pharmacy Department.

Workshop Sessions

Enrollees for the Institute were divided, according to bed size, into six workshop groups for discussions on specific problems. With each group selecting its own subject, such issues as charges for drugs, therapeutics committees and hospital formularies, and detailmen and pharmacy exhibits in hospitals were covered. Summaries of the conclusions reached in the various groups were brought out in a panel discussion on Tuesday night.

A group of approximately 20 pharmacists from Veterans Administration Hospitals met in a separate session to consider problems in their particular institutions. Mr. John Gooch and Mr. Robert Statler from the VA Central Office in Washington, D. C. were present throughout the week.

In a talk on "Effective Communications," by Dr. George F. Henigan of George Washington University, Washington, D. C., emphasis was placed on the importance of communicative skills —the communication of thought and feeling by means of speaking.

A session on radioisotopes gave hospital pharmacists background on the handling, dosage forms and clinical application of radioactive medications. Presented in the form of a panel discussion, the session was moderated by Mr. Paul Parker, Chief Pharmacist at University of Chicago Clinics, Chicago, Ill. Other participants included Dr. Douglas Johnson of the Southern College of Pharmacy and Dr. Charles M. Huguley of Emory University.

Sessions were also devoted to problems which concern the hospital pharmacist in his day-to-day activities — teaching responsibilities, standardization of drug usage, pharmacy after hours service, utilization of nonprofessional personnel, bulk compounding, dispensing, and numerous other subjects.

In addition to those already mentioned, leaders in the SOCIETY participating in the Institute included Mr. Claude Busick, President of the ASHP, Dr. George F. Archambault, Mr. Allen V. R. Beck, Mr. Grover C. Bowles, Mr. Albert P. Lauve, and Mr. I. Thomas Reamer. Also present throughout the week was Dr. Sarah Hardwicke, Secretary of the A.H.A.'s Council on Professional Practice. In a paper on Accreditation, she brought hospital pharmacists up-to-date on current concepts of the Accreditation Commission. Mrs. Helen Pruitt Swift of the American Hospital Association served as Institute Coordinator.

Certificates were awarded during the final session on Friday with Dr. R. C. Williams, Director, Division of Hospital Services, Georgia Department of Public Health, speaking.

1956 Institutes Scheduled

The American Hospital Association has announced plans for two Institutes on Hospital Pharmacy to be conducted in 1956. As during previous years, the Institutes will be sponsored in cooperation with the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Dates and places scheduled for 1956 are as follows:

University of Texas, Austin, Texas—June 18-22, 1956

University of Chicago, Chicago, Illinois—August 20-25, 1956

Details regarding the programs for the two meetings will be published in THE BULLETIN early in 1956 and all members of the ASHP will receive applications for registration.

therapeutic TRENDS

edited by LEO F. GODLEY

Demecoline In Gout

Demecoline is an alkaloid from *Colchicum autumnale* which is also the source of colchicine. In a series of 20 patients with acute gout, 15 experienced complete remission in 48 hours. Four patients had partial remission of symptoms. The medication was given intravenously in 1 to 4 mg. doses. Two patients experienced diarrhea which was the only side effect noted. This report was published in *Arch. Int. Med. 96*:153 (August) 1955.

Testosterone For Migraine In Women

Methyl testosterone was given to 60 women who suffered from migraine attacks. The dose employed was 10 mg. daily for 4 weeks, then 10 mg. every other day for 8 weeks, and then 10 mg. every third day for 8 weeks. According to the report published in *J. Mich. State Med. Soc. 54*:577 (May) 1955, 49 of these women were relieved of headache and reported that they felt better both mentally and physically.

Relapse occurred in 27 patients after periods up to two years following therapy, but attacks were mild and the condition responded to retreatment with methyl testosterone. Side effects noted were hirsutism, acne, deepening of the voice, menstrual irregularity, weight increase, nervousness, and increased libido. Patients with goiter and diabetes require special consideration with testosterone therapy.

Coliformin—An Antibiotic Fungicide

Coliformin is an antibiotic produced by a specific *Bacillus cili*-type. It is highly effective against a variety of human and plant fungi. This antibiotic is a polypeptide. It was isolated and studied in Sweden. The report was published in *Antibiotics and Chemotherapy 5*:218 (April) 1955.

Sulfones In Tuberculosis

Two Indian investigators reported on the activity of two sulfone compounds (p-ethylamino-p′-aminodiphenyl sulfone and p-isobutylamino-p′-aminodiphenyl sulfone) in combating experimental tuberculosis in guinea pigs. In this study, which was published in *Brit. J. Pharmacol 10*:113 (March) 1955, the anti-TB activity of these two sulfones was adjudged equal to dihydrostreptomycin and isoniazid. No toxic symptoms were produced by the use of these therapeutic agents in the animals that were treated.

Triiodothyroacetic Acid In Myxedema

Triiodothyroacetic acid (triac) was used by Trotter at University College Hospital in England to treat a case of myxedema. The clinical signs of the disease were rapidly reversed on oral doses of 1 mg. triac every 4 hours. Maintenance therapy was set at 2 mg. daily. This report appeared in *Lancet II*:374 (Aug. 20) 1955.

Calcium Versenate In Motor-Neurone Disease

Calcium versenate was used to treat motor-neurone disease with some degree of success by Campbell of the Bristol Royal Hospital. A case history of a patient with motor-neurone disease who was treated with calcium versenate appeared in *Lancet II*:376 (Aug. 20) 1955. The drug was given in daily doses of 2 Gm. for 4 days. Two such courses of therapy produced considerable improvement. This neuropathy apparently resembled lead poisoning but no proof of such poisoning could be found.

Mysuran In Myasthenia Gravis

Mysuran Chloride (WIN-8077) is N, N′-*bis* (2-diethylamino-ethyl) oxamide bis-2-chlorobenzyl chloride. According to a report which appeared in *J. Am. Med. Assoc. 158*:625 (June 25) 1955, WIN-8077 is an effective agent in the management of myasthenia gravis. These clinicians state that it is more powerful and has a duration of action approximately twice that of neostigmine or Mestinon. Also it has less side effects on the GI tract than these two agents.

In this study 50 patients with myasthenia gravis were given 2 to 75 mg. Mysuran orally in syrup

form. It was found superior to previous treatment with the above drugs in 41 of this group. The remaining 9 patients returned to previous therapy. Of these 41 patients, 17 have experienced a reduction in side effects as compared with previous therapy, and 20 have noted a prolongation of action. Eight patients are taking the same amount of Mysuran in milligrams as they did of neostigmine, but most patients require fewer milligrams. There have been no significant side effects or involvement of other organs as substantiated by blood and urine studies.

The oral route of administration was found to be more practical since it affords a greater safety factor in that it is easier to regulate dosage. The equivalent oral dose is about 30 times as much as the parenteral dose.

Material for this study was supplied by Winthrop-Stearns.

Arlidin In Intermittent Claudication

Arlidin is 1-(p-hydroxyphenyl)-2-(1′-methyl-3′-phenyl-propylamino) propanol. It is a vasodilator. Pomeranze et al conducted a study on 24 diabetics who had intermittent claudication or nocturnal muscle cramps. The results of their study were published in *Angiology 6*:271 (June) 1955.

The patients received 3-12 mg. of Arlidin orally 3 times a day. In 22 of these patients a good response was noted; 2 patients did not respond to Arlidin; 3 patients elicited as good response to a placebo as to the drug.

Blood and urine studies in individuals treated with Arlidin were essentially negative; but dizziness and weakness were experienced in some cases.

Tubulin For Indolent Ulcers

Tubulin is a deproteinated kidney extract. Laboratory tests demonstrated that it is a prompt and long acting vasodilator that could be used safely on animals and humans. It was applied to chronic indolent ulcers resulting from varicose veins, arteriosclerosis obliterans, thromboangiitis obliterans, diabetes mellitus, and collagen diseases. The ulcers had not responded to previous therapy. Patients were given oral and/or parenteral doses of 5-10 drops by mouth or 1 ml. parenterally every 1 or 2 days.

In 15 cases, the ulcers healed completely. In 2 cases, the process was arrested; and in one case there was no response. There were some recurrences and they responded to a second course of Tubulin.

According to this report which was published in *Angiology 6*:260 (June) 1955, Tubulin causes an increase in urinary excretion of sodium, potassium, and chloride. It would, therefore, be contraindicated in patients on restricted sodium intake.

Tubulin for this study was supplied by Increto Products Co.

BS-5930 In Parkinsonism

BS-5930 is β-dimethylaminoethyl-2-methylbenzhydryl. Gillhespy et al in England studied the effects of the drug on 67 patients with Parkinsonism and according to their report in *Brit. Med. J. II*:352 (Aug. 6) 1955, 39 of these patients experienced significant clinical improvement. In 31 of the 39, improvement was better than had been obtained with any previous therapy. Dosage was begun at 50 mg. 3 times a day and side effects were minimal when the total daily dosage did not exceed 250 mg.

Properdin In Natural Immunity

Properdin is a protein that has been isolated from blood. An editorial in *J. Am. Med. Assoc. 158*:309 (May 28) 1955 stated that this substance quite possibly might play a major role in the process of natural immunity.

The rat had the highest serum properdin content and the guinea pig had the lowest among the species tested. It was further correlated with the fact that the rat was very resistant to bacterial infection while the guinea pig was quite susceptible.

Following body irradiation, the properdin serum level of the rat fell. Rats so treated developed severe enteric bacteremia. If these rats were given 250 units of cow properdin after irradiation, the lethel effects of irradiation were counteracted.

Rauwolfia In Psoriasis

A report on the oral use of *Rauwolfia serpentina* (whole root) in the treatment of psoriasis appeared in *Brit. Med J. 1*:1428 (June 11) 1955. Thirty patients, in whom all types of psoriasis were represented, were given 50 mg. tablets four times a day. In 15 patients the lesions cleared, improvement was noted in 10, there was no change in 4, and one patient became worse. Placebo tablets were given to 14 control patients and lesions cleared in 2, while 3 were improved, and 9 showed no change.

Antibiotics And Hydrocortisone

A synergistic effect between the broad-spectrum antibiotics and hydrocortisone when used locally in the treatment of complicated skin diseases has been recently reported. In a study carried out at the University of Maryland School of Medicine, 1,655 cases were treated with hydrocortisone free alcohol, hydrocortisone acetate and hydrocortisone-antibiotic combinations. Results of the study are published in *Medical Times 83*:227 (1955).

timely drugs

Equanil

. . . is a new relaxant indicated in anxiety and tension states, neurological conditions where muscle spasm is a factor, muscle spasm due to rheumatic conditions, and certain convulsive disorders. Chemically, it is 2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate.

Equanil is administered orally in tablets of 400 mg. each. The recommended starting dose is one tablet three times daily and, if indicated, an additional tablet an hour before retiring. The dose may be adjusted, either up or down, according to the clinical response of the patient. Because of the low toxicity of Equanil, wide variations in dosage can readily be made. Transient drowsiness is virtually the only side effect.

Equanil is a product of Wyeth Laboratories.

Incremin

. . . (Lysine-Vitamin Drops) an effective new remedy for many cases of poor appetite and slow growth in infants, is available from Lederle Laboratories Division, American Cyanamid Company. The new product combines an essential amino acid, Lysine, with vitamins B_1, B_6 and B_{12} in cherry-flavored drops that can be easily added to milk, milk formula or other liquid.

In recent tests, Lysine has shown remarkable results in stimulating growth and appetite in underweight infants. Vitamins B_1, B_6 and B_{12} have long been recognized as appetite stimulants.

A daily dosage of 0.5 to 1 ml. (10 to 20 drops) of Incremin improved the appetite of test infants and resulted in weight gains and increased growth within one week in 65 percent of the cases. It was found that this dosage, mixed with an ounce of formula early in the day, insured assimilation of the entire amount. Current research indicates Incremin is also beneficial to geriatric patients with poor appetites.

Mycostatin Ointment

. . . a new antifungal preparation, is now available from E. R. Squibb & Sons. Indicated for the treatment of fungal infections of the skin, it is particularly useful against those caused by *Candida albicans* (Monilia). In combination with oral Mycostatin, (Squibb nystatin) it may be used to treat the manifestations of generalized moniliasis which affect the skin or exposed mucous membrane. Mycostatin Ointment contains 100,000 units of Mycostatin, an antifungal antibiotic, per gram of Plastibase. The Plastibase vehicle (Squibb oleaginous ointment base) provides fast, regular, and thorough release of the antifungal agent. Mycostatin Ointment is nonsensitizing and does not provoke untoward reactions even after prolonged use. There is no evidence that *Candida albicans* develops resistance to it. Supplied in one-ounce tubes, Mycostatin Ointment should be applied directly to the mycotic lesions once to several times daily until they have healed.

Mycostatin Vaginal Tablets

. . . a new product of the E. R. Squibb and Sons Co., offers an effective treatment for vaginal moniliasis. The action of Mycostatin (Squibb, nystatin) is highly selective and, unlike other preparations, does not destroy the normally-present bacteria which are useful in protecting the vagina against infection. Each tablet contains 100,000 units of the antifungal agent Mycostatin and 0.95 Gm. of lactose. Lactose promotes the natural defense against other infectious organisms, trichomonads, by aiding the restoration of normal balance among the vaginal bacterial flora.

Undesirable reactions to Mycostatin vaginal tablets are rarely observed, and no allergic reactions have been encountered even after prolonged administration. There is no evidence that monilia organisms become resistant to Mycostatin.

Mycostatin vaginal tablets are supplied in packages of fifteen, each individually foil-wrapped. Tablets should be inserted into the vagina once or twice daily. Prolonged therapy may sometimes be required.

Nitretamin

. . . (triethanolamine trinitrate diphosphate, Squibb) it a new long-acting nitrate in tablet form for the prevention of attacks of angina pectoris. It is an effective coronary vasodilator which improves the blood supply to the heart muscle.

Although not a substitute for the quick-acting drugs such as nitroglycerin or amyl nitrite, Nitretamin is appreciably longer acting and is often effective in preventing anginal attacks. It often reduces, and may eliminate, the requirement for nitroglycerin. The unwanted effects characteristic of nitrite therapy are rarely caused by Nitretamin, even on prolonged treatment. Tolerance to the drug has not been reported, and the individual's dosage can therefore remain constant.

There may be no significant effect before the third day of administration, and the full effect may not develop in less than a week. The usual dose is four to five 2 mg. tablets per day.

Otamylon Ear Drops

. . . is a clear, odorless, sterile, amber, viscid liquid containing five percent Sulfamylon hydrochloride and five percent benzocaine (ethyl aminobenzoate) in propylene glycol (with 0.4 percent chlorobutanol as a preservative). Otamylon is effective against all commonly encountered ear pathogens. Through local analgesic and hygroscopic effects, it quickly soothes the irritated or inflamed surfaces and promotes prompt healing. In clinical tests Otamylon has proved highly successful in acute and chronic otitis externa, furunculosis, acute and chronic otitis media, after mastoidectomy and fenestration operations.

For administration of Otamylon ear drops, the external ear canal should be gently cleansed as much as possible and then dried. Otamylon is then applied by either of two methods—1. With the patient lying on the non-affected side, two or three drops are instilled into the ear canal. The canal is then plugged with sterile cotton. 2. An alternate method is to insert a gauze wick moistened with Otamylon into the external ear canal.

For the first few days cleansing of the canal and application of Otamylon should be carried out three or four times daily.

Placidyl

. . . (ethchlorvynol, Abbott) is a mild nonbarbiturate hypnotic available from Abbott Laboratories. Placidyl provides mild hypnosis without the initial excitation or hangover sometimes associated with barbiturates. Because hangover is absent, Placidyl is also particularly useful for those patients who awaken in the early morning.

Reports from over 20 investigators involve about 1,200 patients with a wide variety of diseases. The reports indicate that 500 mg. of Placidyl is a safe, effective hypnotic dose. Side actions are negligible in incidence, and the drug is not contraindicated in liver and kidney disease. Doses to 1,000 mg. produced no observable effect on pulse, blood pressure, respiration, blood or urine.

The recommended adult dose for pleasant induction of sleep is 500 mg. at bedtime. The product is supplied in 500 mg. capsules in bottles of 100.

Placidyl is chemically unrelated to the barbituric acid derivatives, bromides, chloral hydrate, paraldehyde, etc.

Polycycline Suspension with Triple Sulfonamides

. . . is a suspension in citrus flavored coconut oil containing in each teaspoonful (5 ml.), 125 mg. of tetracyline hydrochloride and 167 mg. each of sulfadiazine, sulfamerazine and sulfamethazine. It is indicated in the treatment of infections caused by gram-positive and gram-negative bacteria, especially for bacillary (shigella) dysentery and gonorrhea. Polycycline suspension with triple sulfonamides is a product of Bristol Laboratories.

Reditrin Capsules

. . . offer a potent hematinic for use in many forms of anemia. The product, supplied by Sharp and Dohme, contains in each capsule vitamin B_{12}, 10 mcg.; vitamin B_{12} with intrinsic factor concentrate, 0.5 U.S.P. oral unit; ferrous sulfate, 300 mg.; ascorbic acid, 50 mg.; folic acid, 1 mg.; thiamine mononitrate, 2 mg.; riboflavin, 2 mg.; pyridoxine hydrochloride, 1 mg.; niacinamide, 10 mg.; liver fraction 2 N.F., 50 mg.; and desiccated stomach, 50 mg.

Stental Extentabs

. . . are extended action phenobarbital tablets available from the A. H. Robins Co. Each light pink, coated, extended action tablet contains in the outer coating 16.2 mg. of phenobarbital and in the core 32.4 mg. of phenobarbital. The sedative action extends over a period of ten to twelve hours.

Surgical Cement

. . . is an adhesive containing liquid latex, *n*-hexane, zinc oxide, and mineral, for sealing ileostomy, colostomy and other post-operative appliances to the body. It is marketed in three ounce tubes by Graham-Field Surgical Company, Woodside, Queens, N. Y.

Troph-Iron

. . . is a new, pleasant-tasting, high-potency preparation which stimulates appetite, promotes growth and simultaneously corrects nutritional iron deficiency, has been introduced by Smith, Kline and French Laboratories. Supplying high concentrations of vitamins B_{12} and B_1, and iron in the form of ferric pyrophosphate, the new product is particularly effective in treating cases where iron deficiency accompanies anorexia. Troph-Iron has the additional advantage of being unusually palatable.

Valmid Tablets

. . . offer a short-acting, non-barbiturate sedative available from Eli Lilly and Co. Supplied in tablet form, each scored tablet contains 0.5 Gm. of ethinamate (1-ethinylcyclohexyl-carbamate). Valmid is indicated for insomnia caused by mental unrest, excitement, fear, worry, apprehension or extreme fatigue. Its sedative action is noted in fifteen to twenty-five minutes and the effect disappears completely in about four hours.

Vi-Daylin Drops

. . . is a citrus-flavored mixture of seven essential vitamins for infants. Vi-Daylin is a product of Abbott Laboratories. Stable without refrigeration, Vi-Daylin drops mixes readily in formula, milk, fruit juices and cereals. Vi-Daylin drops is a new companion product to Abbott's popular liquid nutritional formula, Vi-Daylin. The dosage for infants is 0.3 ml. to 0.6 ml. daily as directed by the physician. A special dropper is calibrated at 0.3 ml. to 0.6 ml. making it easy to measure the exact dosage. After the first year, children can take Vi-Daylin from the spoon.

Vi-Thyro

. . . is a new compound for complete thyroid therapy. It is being marketed by the J. B. Roerig & Co., division of Chas. Pfizer & Co., Inc. The preparation is designed to provide effective thyroid substance together with essential metabolic elements in a single dose.

Each Vi-Thyro capsule contains the equivalent of one grain of U.S.P. thyroid activity in combination with B complex vitamins, calcium pantothenate, vitamins A, D, and ascorbic acid, lipotropic substances, and minerals. Vi-Thyro is indicated for any disorder requiring thyroid as diagnosed by the physician.

During clinical trials, Vi-Thyro was found to possess full thyroid effectiveness without producing any undesirable side effects. Past medical research has established that effectiveness of the thyroid hormone is dependent upon the presence in adequate amounts of certain metabolic substances.

Hypothyroidism or decreased activity of the thyroid gland may cause many different disorders in the human body. Infertility, cretinism, certain types of obesity, menstrual and skin disorders are but a few which may require an effective and complete thyroid therapy.

Vi-Thyro capsules are soft gelatin, odorless, tasteless, and brown in color. They are marketed in bottles of 100 capsules.

CURRENT LITERATURE

edited by SISTER MARY ETHELDREDA, *St. Mary's Hospital, Brooklyn, N.Y.*

American Professional Pharmacist

JULY, 1955—"Hospital Pharmacy Internships," by G. Halsey Hunt, M.D. An expert in medical training organization suggests additional guideposts for the development of hospital pharmacy internships and policies. (EDITOR'S NOTE: Same article which appeared in May-June issue of THE BULLETIN.) *page 636*

AUGUST, 1955—"Pharmaceutical Teaching and Research in British Hospitals," by T. D. Whittet. B.Sc., Chief Pharmacist and Lecturer in Pharmacy, University Hospital and Medical School, London. Describes the contributions of hospital pharmacy to the educational activities in Great Britain. Medical, dental and nursery school programs are candidly evaluated. *page 722*

Hospital Management

JULY, 1955—"Adopt Code for Pharmacy Advertising." Presents a 10-point code of ethics governing the preparation of medical advertising and sales promotional material adopted by the Pharmaceutical Advertising Club of New York and the Midwest Pharmaceutical Advertising Club. *page 35*

"Working Agreement with a Local Pharmacy," by Frank E. Kunkel, Pharmacist, Cincinnati, Ohio. A retail pharmacist describes an effective arrangement in which a 54-bed institution receives the services of a pharmacist and indicates that small hospitals and local pharmacies can reach a sound business arrangement offering benefits to the patient, hospital and pharmacy. *page 78*

AUGUST, 1955—"Single or Multiple Dose Containers?" by William Whitcomb, Chief Pharmacist, General Hospital, Rochester, N.Y. Presents the results of a survey of 21 hospitals which disclosed that the safety factor was considered so important that, wherever practical, single dose containers were recommended. *page 74*

The Hospital Pharmacist (Canada)

JULY-AUGUST—"Pharmacy in the University Hospital," by J. L. Summers. A description of the Department of Pharmaceutical Services in the new University Hospital at University of Saskatchewan, Saskatoon. (Reprinted from the *Canadian Pharmaceutical Journal,* July, 1955). *page 210*

"History of Hospital Standardization Movement," by Mrs. I. E. Stauffer. Presents historical background of accreditation standards for hospitals, the role of the American College of Surgeons, and the program as now set up under the Joint Commission on Accreditation of Hospitals. *page 215*

"Economic Aspects of Large-Volume Intravenous Solutions—Part II," by William Laing. Continuation of article presented in May-June issue. Covers factors to be considered in establishing a sterile solutions program. *page 225*

Hospital Progress

AUGUST, 1955—"Curriculum Changes," by Louis C. Zopf, Dean, College of Pharmacy, State University of Iowa. Presents the effect of changes on the preparation and on the supply of hospital pharmacists. Paper presented at the 1955 Institute on Hospital Pharmacy of the Catholic Hospital Association. *page 76*

J. Am. Pharm. Assoc., Pract. Pharm. Ed.

JULY, 1955—"Revised Compendia Now Available —Official December 15 (U.S.P. XV and N.F. X). Outlines changes in the new *United States Pharmacopeia* and *National Formulary.* *page 424*

Modern Hospital

JULY, 1955—"The Synthesis of Confusion," by Carl C. Pfeiffer, M.D. A review of the use of drugs in treatment of the mentally ill. *page 100*

Southern Hospitals

JULY, 1955—"An Administrator-Pharmacist Looks at Today's Hospital Pharmacy," by Joe Vance. The author warns of dangers which may creep into this fine division of pharmacy. *page 24*

BOOK REVIEWS

DRUGS AND DRUGGISTS, fourth edition, 1955, William R. Arthur, 26 chapters plus Federal Statutes and Regulations and Appendices. 399 pages. Price $6.00. West Publishing Company, St. Paul, Minnesota.

This is a "must" book for the library of the hospital pharmacist who seeks to be well informed on the common law and statutes applicable to the practice of his profession. It is by far the most outstanding text in its field in the opinion of this reviewer. The first edition appeared in 1935. In this, the fourth (1955) edition, the author has included the recent statutes and decisions affecting the legal responsibilities of practicing pharmacists. Many of the older case discussions have been rewritten in the light of present day statutes and decisions.

The text is well organized and clearly presented. It begins with a historical introduction, then moves on for 26 chapters with a discussion of state and local laws affecting the practice of pharmacy. Part II of the text deals with the Federal statutes and regulations affecting pharmacists. The Appendices include a brief but excellent legal glossary as well as the Uniform Narcotic Drug Act.

Difficult legal subjects for lay presentation such as the law of negligence, contributory negligence, proximate and remote cause rules, employers' responsibility for mistakes of employees, degree of care and skill required of pharmacists, and special rules of law applicable to drug litigation are handled in a style easily understandable by one without previous legal training.

While no attempt was made to include the special subjects of interest to hospital pharmacists (such as the application of the Charitable Trust Doctrine, state hospital licensing acts affecting the practice of hospital pharmacy, the legal status of procedural manuals, P. R.N. orders, Federal regulations concerning stills in hospitals, responsibilities involved in the use of investigational drugs, and the Narcotic and Internal Revenue Bureau regulations affecting solely the practice of pharmacy in hospitals), the otherwise broad coverage given by the text makes it an indispensable volume for all pharmacists, including those of us with hospital practices.

The Index is excellent and sufficiently exhaustive to simplify locating the subject in which the reader is interested.

GEORGE F. ARCHAMBAULT

THE EXTRA PHARMACOPŒIA (Martindale), Volume II, 23rd edition. Published by direction of the Pharmaceutical Society of Great Britain. Pp. xxix+1501. Price 57s. 6d. (postage 1s. 6d.). The Pharmaceutical Press, 17, Bloomsbury Square, London, W.C.1.*

The second volume of the new Extra Pharmacopœia, published this week, forms the happy conclusion of a formidable task of revision. The increasing scope of pharmaceutical practice ensures that this encyclopedic work will be found on the bookshelves of the practitioner and laboratory worker. Superficially, Volume II of "Martindale" may not seem to have as much practical value for the pharmacist as the first volume that appeared three years ago, yet, everyone who has been away from textbooks for some years, but wants to follow the technical literature intelligently and to consult helpfully with physicians, should find the new volume a useful one that clearly supplants its predecessor published in 1943.

A nation's pharmaceutical literature reflects its needs in the field of medicine. And the comprehensive guide to, and commentary on, drugs and drug standards represented by the Extra Pharmacopœia fulfills a need reflected by comparable reference books in other countries as well. Their vitality no doubt has been reinforced, since the 18th century, by the tendency to restrict pharmacopœias to essential "drugs of choice" and to assume that the growing knowledgability of pharmacists makes commentary and explanation unnecessary if not even an indignity. This bare-bones style of pharmacopœia revision drew further modern justification from the legal implications and responsibilities that accompany anything found on their pages. It is interesting that this circumstance brought similar answers in the two centres of Anglo-Saxon pharmacy. From the 17th century onward, the English "dispensatories" (differing from the pharmacopœial meaning of the old "dispensatorium") offered commentaries on translations into English of the London and other pharmacopœias, gradually expanding into more or less comprehensive reference books.

ANALOGOUS U.S. WORKS

Forerunners of the Extra Pharmacopœia were put to good use in early America. The first American Dispensatory (1806), in fact, was more or less "lifted" from Duncan's New Edinburgh Dispensatory. America soon developed a more independent spirit pharmaceutically as it did in the politico-cultural sphere. But a parallel in the basic books of pharmacy remains in the two nations, even if no exact analogies exist. When the U.S. Pharmacopœia was drastically overhauled in the sixth revision (1882), and purified of drugs and formulæ not considered essential, an unofficial National Formulary appeared in its wake (1888). This work of the American Pharmaceutical Association (counterpart of the British Society) gradually became more authoritative under state laws and since the enactment of the federal food and drug law of 1906 has had precisely the same legal status as the U.S. Pharmacopœia. The British Pharmaceutical Codex (founded in 1907) reminds the American pharmacist of his National Formulary. The Codex was given broader scope in 1934, two years after the British Pharmacopœia so rigorously expunged drugs which had been marked as second choice and redundant. Meanwhile, the Codex has been acquiring legal stature reminiscent of the way that the American National Formulary developed.

This still left room for an encyclopedic type of pharmaceutical reference book, which has largely been filled on one side of the Atlantic by the United States Dispensatory and on the other by The Extra Pharmacopœia.

*Volumes I and II of *The Extra Pharmacopoeia* are available in the U. S. from Overbeck's Book Store, Ann Arbor, Mich. Price $8.50 ea.

The accompanying review of *The Extra Pharmacopoeia*, Volume II, is reprinted from *The Pharmaceutical Journal* (London), Sept. 24, 1955, page 301. The author of the review, Dr. Glenn Sonnedecker, is Assistant Professor of Pharmacy at the University of Wisconsin and Secretary of the American Institute of the History of Pharmacy. He is presently in Europe as both a Fulbright Scholar and a Guggenheim Fellow.

The two books have a roughly similar outlook, scope, and reputation—without being analogous. The U.S. Dispensatory has been published continuously since 1833, when its founders promised that it would not be "a mere edition of one of the European Dispensatories," meaning particularly the English! Unlike the Extra Pharmacopœia, it always has been a private publishing venture.

Pharmacists will recall, however, that the Society has been responsible for the Extra Pharmacopœia only since 1933. It was launched in 1883 by the pharmacist William Martindale, in collaboration with a medical colleague, W. Wynn Westcott. Martindale left his post as chief pharmacist at University College Hospital to conduct a pharmacy in New Cavendish Street, London, and from demands of his retail and manufacturing practice came the idea and stimulus to produce the book. His son, William Harrison Martindale, Ph.D., was likewise a practising pharmacist and served as chief editor of the Extra Pharmacopœia from the time of his father's death in 1902 until the end of his own life in 1933. The 23rd edition of "Martindale" now incorporates, and resurrects in a subtitle, Squire's 'Companion to the British Pharmacopœia,' which appeared from 1864 until 1916. The "Companion" was first edited by Peter Squire, chemist-in-ordinary at the court of Queen Victoria and one of the founders of the Pharmaceutical Society, and later on by his sons. It inspired an American 'Companion to the United States Pharmacopœia,' which died in its second edition from acute competition—a fate ultimately met by Squire's Companion likewise, following the passing of Peter Wyatt Squire.

The present Extra Pharmacopœia, like each of its predecessors, is bigger than the last. Volume II now at hand has had added to it another 384 pages, despite the deletion of what the editors felt could be considered outmoded or unessential. It is larger than were both volumes together forty years ago. With Volume I, the complete work now totals 2853 closely packed pages. This ambitious scope represents both an advantage and a handicap. While "Martindale" hardly can be considered any longer a "pocket-book," the editor and publisher have done a remarkable job of staying within the concept and format of a compendium. The unusually detailed index (167 pp.), table of contents, and judicious use of boldface subheadings assure that the volume will be just as handy to use as ever.

SECTIONS OF THE NEW BOOK

The analytical addenda to the materia medica of Volume I occupies about 30 percent of Volume II (446 of 1501 pp.). This section has undergone modest expansion within its traditional scope. It offers, of course, a comparative guide to the drug standards and assays of foreign pharmacopœias and other official publications, without being a laboratory manual. It also records considerable unpublished information from the laboratories of The Pharmaceutical Society, a by-product of recent work on the B.P.C. and the British Veterinary Codex. Changes in the new U.S.P. and N.F., which become official in December next, unfortunately were not available in time to include in the text. It should be noted, however, that the more significant changes in American assays are given a last-minute tabulation in the Preface (p. xi). Abstracts from approximately 275 journals and references to uncounted books, appearing under the relevant drug titles, constitute a valuable feature of the analytical addenda as they do for the Extra Pharmacopœia as a whole.

Following the analytical addenda are 11 concise sections (about 13 percent of the volume) of special interest to the pharmaceutical analyst. Three of them are entirely new: Ion-exchange resins, titrations in non-aqueous media, and microbiological assay of vitamins. Analytical applications of ion-exchange resins have increased markedly as better resins have become available. The four main types of resins are discussed with regard to their preparation, properties, and pharmaceutical uses. The relatively new and widely useful method of titrating in non-aqueous media is outlined from a theoretical viewpoint (Brönsted-Lowry), followed by fairly full practical details. Recognising the important niche gained by microbiological assay for vitamins of the B group since the last edition, guide-posts are set for newcomers to this type of assay without minimising the problems involved in extraction and technique.

Most of the other sections in this group have not been changed fundamentally, although the discussion of analytical absorption spectrophotometry has been completely rewritten in the light of advances in instrumentation and application. Under Hydrogen Ion Concentration, some new tables give quantities of ingredients for the preparation of buffered isotonic eye-drops. Under Oxidation-Reduction Potentials, the table of potentials has been extended to include all the more important systems. The section on polarographic analysis puts the reader in touch with the latest literature on methods and pharmaceutical applications. The discussion of microanalysis now focuses more closely on principles and evaluation, less on description, thus offering clearer guidance on which methods could be applied with advantage to particular substances. The section on adsorption chromatography has been extended to include partition and paper chromatography, with literature references to the striking advances of recent years.

By pulling together in that edition the various sections on foodstuffs—under the broad heading of Food Analysis—the general methods for determining specific constituents are grouped together and described first. Some information on specific foods has been dropped. This is followed by the principal provisions of food law, orders, and recommendations (93 pp. on foods, or about 6 percent of the total). Information on physical and chemical examination of water (16 pp.) is based on the 1953 revision of "Approved Methods." To encourage a more systematic approach to the identification of organic unknowns, the material on various types of tests has been rearranged and considerably expanded (now 105 pp.; 7 percent.). Extensive tables include all the new organic chemicals in the B.P., Codex, and Veterinary Codex.

STRUCTURE-ACTION RELATIONSHIPS

The discussion of nomenclature of organic compounds and of structure-action relationships (34 pp.) should be of especial interest to practising pharmacists. The increasing use of synthetic organic medicinals emphasises the importance of consistent naming of chemicals, and this section has been written to conform with recommendations of the International Union of Pure and Applied

Chemistry, as interpreted in Great Britain by the Chemical Society. Unfortunately, as the editors concede, "The names purporting to be accepted scientific names appearing in disclosures required by the Pharmacy and Medicines Act, 1941, for substances recommended as medicines are often inadequate and sometimes misleading." Nevertheless, "Martindale" will serve well to refresh or confirm one's memory in unravelling complex chemical descriptions and unveiling the relationship of new drugs having similar effects. The pharmacist prepared to discuss such questions with physicians offers a professional service at least as notable as his diminishing compounding service. The section on the relation between chemical constitution and physiological action likewise reviews a field fundamental to modern pharmacy and medicine. The extensive Bacteriological and clinical Notes, including material on culture media, have been retained and of course brought up to date in this edition (111 pp.; 7 percent.).

The preparation of various types of compressed tablets is covered in a concise new section (12 pp.). Other short sections already familiar in the previous edition have been carefully revised: Sterilisation (supplement on sterility tests added), 15 pp.; Disinfection (with less emphasis on Rideal-Walker value), 17 pp.; Radiotherapy (considerable material on radioisotopes added), 18 pp.; *X*-ray Diagnosis (newer contrast media), 10 pp.; Electrotherapy; Diathermy; Radiant Energy (further condensed in this edition), 14 pp.; and British Spas (emphasis shifted from waters to physiotherapy), 2 pp.

The sections on Nutrition (19 pp.) and Vitamins (42 pp.) are substantially revised. The previous edition, issued as it was in war years, emphasised the question of obtaining adequate intake of the various nutrients. Interpretation of data on the content of foods in terms of human requirements was then somewhat limited by lack of precise knowledge. Meanwhile, improved methods of estimating energy requirements provide more illuminating information, and advances in nutritional research on vitamins have been remarkable since the previous edition. Further exploration of the properties and functions of vitamins with newer techniques, including tracer methods, may in time equally outdate the new edition.

One of the most striking changes noted in Volume II is the fourfold increase of material on Hematology and Clinical Biochemistry, which now comprises about 23 percent of the book. The aim has been "to provide pathologists, pharmacists and workers in clinical laboratories with details of the most useful of the published methods for the various examinations and determinations. The information given is sufficient to carry out each method, but references are provided so that the original literature may be consulted for further information . . ." A number of new methods appear in the material on hematology; recent advances in techniques also show up frequently under the heading of clinical biochemistry.

PROPRIETARY MEDICINES

Volume II concludes with a historical and current survey (37 pp.) of the status of control over the advertising and distribution of proprietary medicines. The Code of Standards of the Advertising Association (1946) and a summary of the Pharmaceutical Society's recommendations (1947), based on a study of the advertising and sale of proprietary drugs, are included. A clearer exposition of labelling requirements has been presented, in the belief that inadequate disclosure of composition is "often because of the inability of the manufacturer concerned to understand exactly what is needed." This section includes a handy guide to a large number of proprietaries that are dispensed on public demand, giving the trade name, producer, and composition of each product. It may be noted, with abashed interest, that manufacturers' claims are omitted from this edition because "these claims are often not justified by the known therapeutic effects of the ingredients." The proprietary prescription medicines (or Mrs. Malaprop's "ethical proprietaries") are listed in Volume I. Some pharmacists probably will miss the glossaries of prescription terms, in five Continental languages, which were crowded out of this 23rd edition. It is said that the Society may transfer this feature to the next edition of The Pharmaceutical Pocketbook.

EDITOR AND COLLABORATORS

With the passing of C. E. Corfield in 1945, the Council of the Society placed the responsibility for editing the new Extra Pharmacopœia in the able hands of K. R. Capper, Ph.D., B.Pharm., F.P.S., D.I.C., assisted by S. C. Jolly B.Pharm., B.Sc., M.P.S., A.R.I.C. A number of collaborators in various specialties have also assisted with the new Edition.

The volume produced by Dr. Capper and his collaborators makes a substantial contribution to pharmacy and will represent the Society as meritoriously in the pharmaceutical libraries of the world at large as it does on the pharmacist's bookshelf in a remote corner of the British Isles.

GLENN SONNEDECKER

ATOMIC ENERGY IN PHARMACOLOGY-INDUSTRIAL AND LEGAL ASPECTS. July 9, 1955 by Dr. Louis C. Longarzo. New York Committee on Atomic Information, Inc. 61 Broadway, New York, N. Y. 28 pages.

This nuclear age has provided us with better tools with which to probe the unknown factors involved in both normal and abnormal biological processes of life. The constructive application of atomic energy by-products has therefore placed a significant responsibility on the pharmaceutical industry to make its contribution to the fight against disease. Although many contributions have already been made in this respect, our industry has not yet fully realized the tremendous possibilities offered by atomic energy.

In this paper, Longarzo attempts to provide the reader with information on atomic energy as it affects the pharmaceutical industry and tries to stimulate an interest in more active participation of the application of these substances. A brief outline of the program of the United Nations International Conference on the Peaceful Uses of Atomic Energy to be held in Geneva, August 8-20, 1955 is submitted.

To indicate the wide application of these materials this paper cites the scope and variety of pharmaceutical investigations with Carbon 14 now under study. Since the 1954 revision of the Atomic Energy Act encourages industrial participation in the peacetime uses of atomic energy pharmaceutical investigations of all types should materially increase.

The author very briefly describes some of the various regulations of the Atomic Energy Commission regarding the procurement and distribution of by-product material.

Of particular interest is the Atomic Energy Commission Industrial Information Depository Libraries for A.E.C. developed non-classified information which are listed in the "Source Reference" section.

CLIFTON J. LATIOLAIS

ASHP affiliates

Mississippi Society

The Mississippi Society of Hospital Pharmacists met at St. Dominic Jackson Memorial Hospital in Jackson, on Wednesday, August 10. Due to the small attendance, informal discussions were held covering Society activities. Membership and affiliation with the ASHP were discussed and it was pointed out that a number of hospital pharmacists in Mississippi had been contacted regarding participation in the state group. Mrs. Doris Cassidy reported on highlights of the Chicago Institute.

Included on the program for the next meeting will be a panel on "Planning a Pharmacy in a Small Hospital."

Georgia Society

The spring meeting of the Georgia Society of Hospital Pharmacists was held in conjunction with the Southeastern Hospital Conference in Atlanta on April 20, 21 and 22. A dinner was held on Wednesday at the Cox-Carlton Hotel with Mrs. Lillian Price, President, presiding.

During the business session it was voted to drop the January and the July meetings so that meetings of the Georgia Society will now be held in the spring and fall. Plans were made to hold the fall meeting in Savannah at the Chatham Memorial Hospital where Mr. J. R. Thomas is Chief Pharmacist.

Mr. Richard A. Anderson, Vice-President of Bristol Laboratories, was introduced by Mr. Charles T. Harrell, formerly from Atlanta and now with Bristol Laboratories in New York City. Mr. Anderson spoke on the many changes in Pharmacy and associated sciences during the past twenty-five years.

Northern California Society

"Recent Advances in Therapy in Psychiatry," was the subject presented at the August 9 meeting of the Northern California Society. The speaker was Dr. Abram E. Bennett, Chief of the Psychiatry Department at the Herrick Memorial Hospital in San Francisco. The meeting was held at the Alta Bates Hospital in Berkeley.

During the business session presided over by President Alphonse A. Seubert, committee appointments were made and reports received.

The recent issue of *Hospital Pharmacy News,* official publication of the Northern California Society, carries articles on the following subjects: From Narcotic Chief, Pharmacists' Liability, Employees Conferences and Personnel Relations, Latest Development in Reserpine Therapy, and Prescription Pricing.

Louisiana Society

New officers of the Louisiana Society of Hospital Pharmacists are President Herbert Mang, Vice-President Gladys Hebert, Treasurer Ola Morgan, and Secretary Anna Mae Cisneros. Mr. Malcolm Claus heads the Program Committee and Mr. Albert Lauve is Chairman of the Membership Committee. Mr. Mario Cresali heads a new Committee which will report at each meeting on any new methods or procedures in current use at local hospitals.

On September 8 the Louisiana Society held a meeting in conjunction with the A.Ph.A. Branch at the Baptist Hospital. Mr. Joseph P. Crisalli of the U.S. Public Health Service Hospital in New Orleans reported on the Atlanta Institute.

Southern California Society

Dr. Thomas R. Kidd, demonstrated the use of the Pacemaker, Afibrillator, Cardioscope, and discussed the use of the Cardiophone in surgery at a recent meeting of the Southern California Chapter of the ASHP. Dr. Kidd pointed out that he believes that these heart devices will be standard equipment in surgery in the near future. The meeting was held at the St. Francis Hospital in Lynwood on September 14, 1955. Mr. Joe Ball, Chief Pharmacist, acted as host for the evening and also presided over the meeting.

Midwest Sister Pharmacists

The September meeting of the Midwest Association of Sister Pharmacists was held at Abbott Laboratories, North Chicago, on September 22. Following the reading of the minutes, Sister M. Theodora gave a report on the project for a suitable antiseptic for thermometers. The results of the project will be printed in the *Adjuvant,* publication of the Midwest Association. Sister M. Cherubim gave a report of the Pharmacy Institute held in St. Louis in May in connection with the Convention of the Catholic Hospital Association. Additional announcements were made and the new officers for the year were installed.

Following the business session, the group had lunch and a tour of the plant which was considered very profitable by all.

Rochester Area Society

The first fall meeting of the Rochester Area Chapter of the ASHP was held on September 12 at Strong Memorial Hospital. The feature of the evening was a film entitled "Fraud Fighters," an official government release about the activities of the Food and Drug Administation activities. Mr. Jonas Bassen, the local FDA inspector, followed with a short talk and a question period which permitted us to gain an insight into little-known aspects of the good work done by the FDA, our mutual problems and aims, and where and how we could assist each other.

as the vice-president sees it

MILTON W. SKOLAUT
National Institutes of Health, Bethesda, Maryland

Each new administration alters the method of operation of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS to some degree. Along with other changes which are occurring, the President wished to have the Vice-President's views on certain of the SOCIETY Activities.

Every officer is continually stressing membership drives. Mr. Busick has again appointed an excellent Committee on Membership and has set the goal for 600 new members. I hope that every local chapter and every member of the ASHP will do their utmost to help the chairman of this Committee accomplish this end. However, I believe in future years the goal should not be a quota, but that we should change our emphasis to the eventual goal of having all hospital pharmacists as active and participating members. Only with this type of total membership can we accomplish the aims of the SOCIETY.

In order to approach total membership the SOCIETY must show each individual member that he is receiving benefits of greater value than his membership dues. I believe that each year of operation brings us closer to this end, but there is still a hard road ahead. The SOCIETY has just completed a very fruitful year at the Miami Beach convention. After a successful year, very often the tendency is to sit back, rest for six months, and then make a last frenzied effort to accomplish our goals by the next convention time. If this sort of attitude is taken by all members, especially members and chairmen of committees, the membership goal will be much further away.

Another activity with which I am particularly familiar and interested in, is the Committee on Pharmacy Operated Central Sterile Supply Services. The Committee feels that this will be a SOCIETY activity which may develop in importance second only to the minimum standards for pharmacy operation and internship training. The Committee has never stated that pharmacies must operate sterile supply services and I sincerely doubt that such a recommendation will ever be made. However, at present the Committee feels that where possible and where the combination service is wanted that there are certain advantages to a joint operation. No chief pharmacist should be forced to operate this service against his or her wishes nor should the chief pharmacist attempt to remove this service from another department's responsibility without their complete cooperation. However, when complete cooperation is available, the Pharmacy Department can operate the Sterile Supply Service efficiently and economically. No combination service has ever operated where there are not certain disadvantages. These disadvantages can be overcome by Pharmacy and Nursing Department committees.

Many hospital pharmacists feel that they are not properly recognized in their hospitals. Several of these hospital pharmacists will never be recognized until more of them are willing to take on added responsibilities and added duties to show that they are capable and directly interested in being a patient care department. The operation of such a service as mentioned above or other activities such as purchasing or administration, all make a pharmacist a more responsible and necessary person for the hospital.

Your Vice-President represented the SOCIETY at the American Hospital Association's Convention in Atlantic City, N. J. during the week of September 19. Many interesting discussions were presented as well as a tremendous equipment and supply exhibit. The booth sponsored by the A.Ph.A. and the ASHP was staffed by members of the Philadelphia Hospital Pharmacists Association and the New Jersey Society of Hospital Pharmacists. To these two groups our thanks for helping to represent the SOCIETY.

I addressed the Philadelphia Hospital Pharmacists Association during September on the aims and plans of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. I also addressed them on a pharmacy sterile supply combination operation.

I hope that I may have the opportunity to visit with more of the local chapters and shall look forward to discussing SOCIETY problems with them.

MILTON W. SKOLAUT

NEWS

ASHP Officers for 1956-1957

Paul F. Parker

Paul F. Parker, Chief Pharmacist at the University of Chicago Clinics in Chicago, Ill., has been elected president of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS for the 1956-1957 term. Mr. Parker has been active in SOCIETY affairs over a period of years having been an assistant editor of THE BULLETIN since 1950. Also, during the 1954-1955 term he served as Chairman of the Committee on Program and Public Relations and as a member of the Executive Committee.

The Vice-President-Elect, Mr. Milton Skolaut, is serving in the same capacity during the current year. He is Chief of the Pharmacy Department of the Clinical Center, National Institutes of Health, Bethesda, Md.

Sister Mary Berenice, St. Mary's Hospital, St. Louis, Mo., has been elected Treasurer for a three-year term beginning in 1956. Sister Berenice has served a term as treasurer of the SOCIETY and has also served on the Executive Committee.

The ballots were counted by a Committee of four ASHP members appointed by President Claude L. Busick, and the results submitted to the Secretary, Gloria Niemeyer. Included on the Committee were Mr. Robert Simons, Memorial Hospital of Wilmington, Wilmington, Del.; Mr. Robert Statler, Veterans Administration Central Office, Washington, D. C.; Mr. Benjamin Wexlar, Philadelphia General Hospital, Philadelphia, Pa.; and Mr. John White, George Washington Hospital, Washington, D. C.

California Seminar

President Claude L. Busick and Dr. Don E. Francke, Editor of THE BULLETIN, participated in the Seminar on Hospital Pharmacy held at the University of Southern California, July 20-31. Dr. Francke spoke at the opening dinner on Friday night which was held at the Statler Hotel in Los Angeles. Mr. Joseph E. Ball, President of the Southern California Society of Hospital Pharmacists presided. Other participants in the two-day meeting included Mr. Charles G. Towne and Dean Alvah G. Hall of the University of Southern California and a number of practicing pharmacists and physicians in the area.

N. E. Council of Hospital Pharmacists

The New England Council of Hospital Pharmacists will hold its second two-day Institute on November 2 and 3 at the Sherry Biltmore Hotel in Boston. This group is made up of hospital pharmacists practicing in Vermont, Maine, New Hampshire, Massachusetts, Rhode Island and Connecticut. Headed by Dr. W. E. Hassan, Jr., Chief Pharmacist at Peter Bent Brigham Hospital in Boston, the Council was organized in 1954 with the purpose of furthering the recognition of hospital pharmacy in the New England area. This is accomplished through educational programs in the form of institutes.

Representatives of the state societies meet three times a year to organize and plan the program for the institutes.

Hospital Week Award to Sister Jeanette

Sister Mary Jeanette, Chief Pharmacist at Mary Immaculate Hospital in Jamaica, N. Y., is the recipient of the Award presented by the American Pharmaceutical Association for the best hospital pharmacy display during National Hospital Week. National Hospital Week, sponsored annually by the American Hospital Association, was observed this year from May 8 to May 14. Members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS were urged to participate.

The display award, consisting of a plaque, will be presented at the Annual Meeting of the SOCIETY to be held in conjunction with the Convention of the A.Ph.A. in Detroit during the week of April 8, 1956.

Sister Mary Jeanette has been in hospital pharmacy practice for more than forty years. She is a recipient of the Lascoff Award, a past treasurer and member of the Executive Committee of the ASHP, and has participated in numerous professional activities both locally and nationally.

Archambault Elected to A.Ph.A. Council

George F. Archambault, immediate past-president of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, has been elected to the Council of the American Pharmaceutical Association for a three year term. Dr. Archambault is Pharmacist Director of the United States Public Health Service, Washington, D. C., and has been active in the A.Ph.A. as well as the SOCIETY over a period of years.

Other members-elect of the Council are F. Royce Franzoni, Washington, D. C., and Robert L. Swain, New York City.

The President-Elect of the Association is John A. MacCartney of Detroit, Michigan. Vice-Presidents-Elect include Robald V. Robertson, Spokane, Washington, and John J. Dugan, New Haven, Connecticut.

The new members of the Council and officers-elect will be installed at the Annual Convention of the American Pharmaceutical Association which is scheduled for the week of April 6, 1956.

Sonnedecker Studies Abroad

Dr. Glenn Sonnedecker, Assistant Professor of the History of Pharmacy at the University of Wisconsin School of Pharmacy, and Secretary of the American Institute of the History of Pharmacy, has recently left the States to do research in Europe as both a Fulbright scholar and as a Guggenheim fellow. Dr. Sonnedecker is well known to hospital pharmacists through his column "Perspectives in Pharmacy," which is published regularly in THE BULLETIN.

Dr. Sonnedecker will work primarily at the University of Frankfurt, at Frankfurt on Main, Germany. He and his family also spent time in London where he attended the Assembly of the International Pharmaceutical Federation and served as chief delegate for the American Institute of the History of Pharmacy.

Dr. Alex Berman, a former hospital pharmacist and a member of the ASHP, will serve as Assistant Professor on the faculty of the School of Pharmacy at University of Wisconsin in Dr. Sonnedecker's absence. He will also serve as Acting Secretary of the American Institute of the History of Pharmacy. Dr. Berman is known to hospital pharmacists as co-author of "Ten Years of the ASHP," published on the occasion of the SOCIETY's Decennial Meeting.

Milne to Speak at Florida Meeting

Mr. Alex Milne, Pharmacy Specialist with the Division of Hospital and Medical Facilities of the U. S. Public Health Service, Washington D. C., will speak at the Florida Hospital Association meeting in St. Petersburg on December 7-9. Mr. Milne, who has played an active role in developing suggested floor plans and equipment and supply lists for various types of institutions, will discuss programming and planning for the pharmacy department. His talk will be aimed toward hospital administrators and others concerned with planning pharmacy departments in hospitals.

The Florida Society of Hospital Pharmacists will also meet in conjunction with the Convention of the Florida Hospital Association.

Remington Medalist Named

Dr. Roy Bird Cook, a practicing pharmacist of Charleston, W. Va., will receive the 1955 Remington Medal, pharmacy's highest recognition of service to the profession. Dr. Cook has served pharmacy in various capacities and is recognized for his contributions as Secretary of the West Virginia Board of Pharmacy and his interest in the field of historical research. The medal will be presented to Dr. Cook at a dinner in his honor in New York City early in December.

The Remington Award was established by the New York Branch of the American Pharmaceutical Association in 1918 to be given annually to the individual who has done most for American Pharmacy in the previous year, or whose continuing contributions to the advancement of the profession have been outstanding.

New Positions Accepted

DONALD T. MILLER has recently been named Chief Pharmacist at the new Memorial Hospital of Chatham County, Georgia. Mr. Miller was formerly associated with Duke Hospital, Durham, N. C., Strong Memorial Hospital in Rochester, N. Y., and Chester County Hospital, Chester, Pa.

EDWARD L. WHIDDON, formerly Assistant Chief pharmacist at Vanderbilt University Hospital, Nashville, Tenn., has been named Chief Pharmacist at University Hospital and Hillman Clinic in Birmingham, Ala.

MISS LOUISE POPE, formerly Chief Pharmacist at the Student Health Service, University of Texas, Austin, has accepted a position as Assistant Chief Pharmacist at the University Hospital, Little Rock, Ark. Miss Pope is a graduate of the University of Oklahoma and holds a Master of Science Degree from The Johns Hopkins Hospital, Baltimore.

MRS. AMALIA HEATON SARGENT has accepted a position with the American Pharmaceutical Association in Washington. Mrs. Sargent is a graduate of the University of Houston School of Pharmacy and completed the internship program at University Hospital, University of Michigan, Ann Arbor, Mich.

Hospital Statistics Published

The Administrators Guide Issue of *Hospitals,* published annually by the American Hospital Association, includes statistical data on hospitals for the previous year. In addition to the section on hospital statistics, the Guide includes a directory to hospitals in the U. S. and Canada, a guide to the American Hospital Association, other organizations and schools, and management guides.

Statistics of particular interest to pharmacists are as follows:

Page 54—Of the 6,447 hospitals reporting, 3,498 have a pharmacy department. The statistics are further divided to show the number of hospitals having a pharmacy according to bed size and according to type of hospital.

Page 76—Figures made available by the American Medical Association show that in 2,671 hospitals reporting, 4,157 full-time and 786 part-time pharmacists are employed. This same information is tabulated by state, that is the number of full-time and part-time pharmacists employed in hospitals in each state is given. Also, the number of pharmacists employed according to type of service is shown.

In summary it is stated that a total of 2,671 hospitals reported the employment of 4,943 pharmacists. Eighty-four percent of the pharmacists were full-time employees. Further, of the total number of pharmacists reported, 73 percent were employed by the non-federal short-term general and special hospitals, and 18 percent were employed in the federal hospitals. Among hospitals classified by specialized type of service, the general hospitals employed 85 percent of all the pharmacists reported.

The Administrators Guide Issue also includes complete data on the number of patients cared for in hospitals, average patient stay, costs, and other significant figures.

New Edition of Calculator Available

A flexible new feature has been added to the "Universal Prescription Costing and Pricing Calculator" that saves more time for the pharmacist as he determines how much every prescription actually costs him.

Richard N. Shaw, sales director of the drug-pharmaceutical division of Becton, Dickinson and Company, announced that the new edition of the Calculator is immediately available to any pharmacist free on request.

The new edition differs from the first in that it comes with three slides or costing scales. Their figures are based on charges of 5c, 6c and 7c per minute respectively for pharmacist's time. When he has decided

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"... Cytal solution was used to irrigate indwelling catheters post-operatively for transurethral resection of the prostate and of bladder tumors. It was found that whereas in using saline one was required to irrigate the catheter, for example every 15 minutes, using the diluted Cytal, one need irrigate the bladder only every hour to an hour and a half or even longer."†

Cytal reduces preparation costs.

Available in a sterile, concentrated liquid form ready to be diluted 9 to 1 with distilled water — no mixing chemicals or resterilizing necessary. However, resterilizing later will not discolor Cytal.

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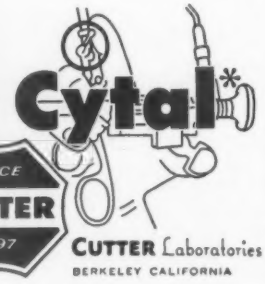
A concentrated solution of hexitols and parabens, Cytal is ready for immediate use when diluted with 9 parts distilled water. Considering the time and expense needed to prepare *other types* of non-hemolytic fluids, you actually cut costs with Cytal.

*T.M. Concentrated Cytal is available in 1 liter Saftiflasks,® sterile and pyrogen-free.



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†Schulte, et al., "Clinical Use of Cytal in Urology," Jrnl. of Urology, May 1954.

which rate is most appropriate for his own operation, the pharmacist inserts that slide in the Calculator. Thus even less paperwork is necessary with the second edition than with the first. Previously, a mathematical adjustment had to be made if the single slide's 7c consideration was inapplicable.

"In helping to develop a systematic approach to the problem of equitable costing and pricing, we have recognized the importance of regional, local and individual store conditions," Mr. Shaw explained.

Beyond its utility in the prescription department, the Calculator can be a practical, effective public relations tool for the pharmacist, Mr. Shaw suggested. He said both manufacturing and retail pharmacy have been trying to inform the public better about the cost of prescriptions, a major public relations problem. The Calculator fits into a public relations program, he continued. If the pharmacist encourages customers to ask questions when they have a prescription filled, he can subsequently show or refer to the Calculator to demonstrate his equitable costing system.

The Calculator was developed by Professor S. B. Jeffries of the Brooklyn College of Pharmacy and was produced and offered last year after intensive studies by Becton, Dickinson, as a service to pharmacy. See BULL. AM. SOC. HOSP. PHARM. 10:428 (Sept.-Oct.) 1953 and 11:455 (Nov.-Dec.) 1954.

Hospitals to be Published Twice Monthly

Hospitals, Journal of the American Hospital Association, will be published twice monthly beginning January 1, 1956, according to announcement made in its July edition.

"Demands from the field for more information at a more frequent rate required that the Association take this unprecedented step," said Edwin L. Crosby, M.D., director of the A.H.A.

"Not only will news arrive more quickly, but this will enable more frequent circulation of news in the hospital," he stated. The decision for biweekly publication was made by the Association's Board of Trustees after several years of study.

The editorial staff is being expanded to prepare more information and new departments for the magazine. The cover of *Hospitals* will be changed to feature pictures.

Hospitals will be published the first and sixteenth of each month. Subscription and advertising rates are being increased to meet higher publishing costs, increased postal rates and increased staffing costs. On January 1 the subscription rates, which have been unchanged since it became a monthly in 1936, will be increased from two dollars to five dollars per year. Cost will be nine dollars for two years and $12 for three years. These charges apply to extra subscriptions requested by AHA members and any subscriptions for non-member hospitals.

Though the subscription increase will establish a single price structure for all subscribers, institutional and personal members of the Association will still receive membership copies of the journal by automatic dues allocation. This allocation will be increased to the new rate. "This will not mean an increase in membership dues." Dr. Crosby explained.

The biweekly publication of *Hospitals* is a part of the new expanded program the A.H.A. has planned for its membership. "We are very pleased to be able to give our members this added service," Dr. Crosby said.

Statement on Hospital Formularies

The following statement on hospital formularies is taken from a column entitled "Accreditation Problems" which is included in the August issue of *Hospitals,* page 22. The material is prepared by the Joint Commission on Accreditation of Hospitals.

What is the requirement of the Joint Commission on Accreditation of Hospitals regarding a formulary?

Usually a formulary is considered to be a comprehensive procedure book such as is used or issued by large teaching hospitals. This is certainly a goal to be sought and is considered part of the armamentarium of such an institution. However, in smaller hospitals this might be unnecessary and not feasible. In the latter, a drug list is all that is required. This list should be amended at regular intervals by the pharmacy committee of the staff with the cooperation of the pharmacist (consulting or otherwise) and the administration.

This list assures that drugs of U.S.P., N.N.R. and B. P. quality only are used and that duplication of medications is not maintained. Such duplication not only leads to crowding of the pharmacy facilities but is an economic drain on the hospital.

Similarly, the pharmacy committee is responsible for policies regarding storage of medications and control of dangerous drugs on the floors.

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For economy, FOLBESYN is supplied in 25-dose packages. Dosage: 2 cc. daily. Each 2 cc. dose contains:

Thiamine HCl (B_1)	10 mg.
Sodium Pantothenate	10 mg.
Niacinamide	50 mg.
Riboflavin (B_2)	10 mg.
Pyridoxine HCl (B_6)	5 mg.
Ascorbic Acid (C)	300 mg.
Vitamin B_{12}	15 micrograms
Folic Acid	3 mg.

FOLBESYN is also available in tablet form, ideal for supplementing the parenteral dose.

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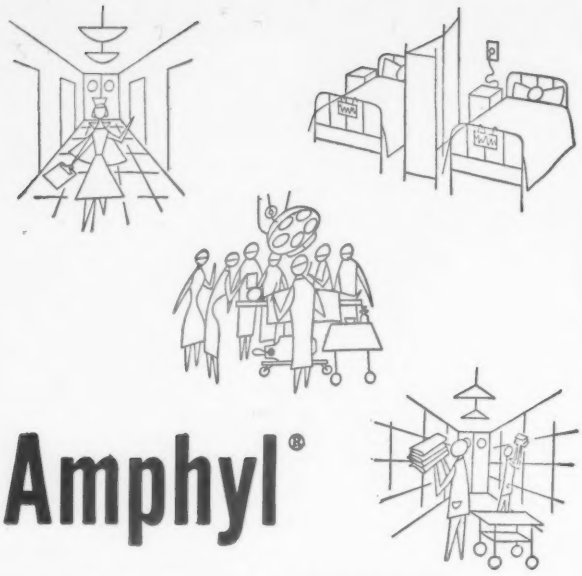

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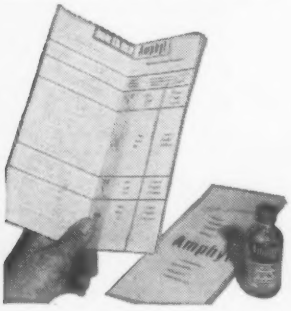
1. Klarmann, E. G.; Wright, E. S., and Shternov, V. A.: Applied Microbiology 1:19 (Jan.) 1953.



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The following reprints which are of interest to hospital pharmacists are available from The Division of Hospital Pharmacy, American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington, D. C.:

Comprehensive Bibliography on Hospital Pharmacy, 1951, 1953, and 1955—$1.00 ea.

Ten Years of the American Society of Hospital Pharmacists—$1.50.

Minimum Standard for Pharmacies in Hospitals—no charge for single copies.

Minimum Standard for Pharmacy Internships in Hospitals—no charge for single copies.

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